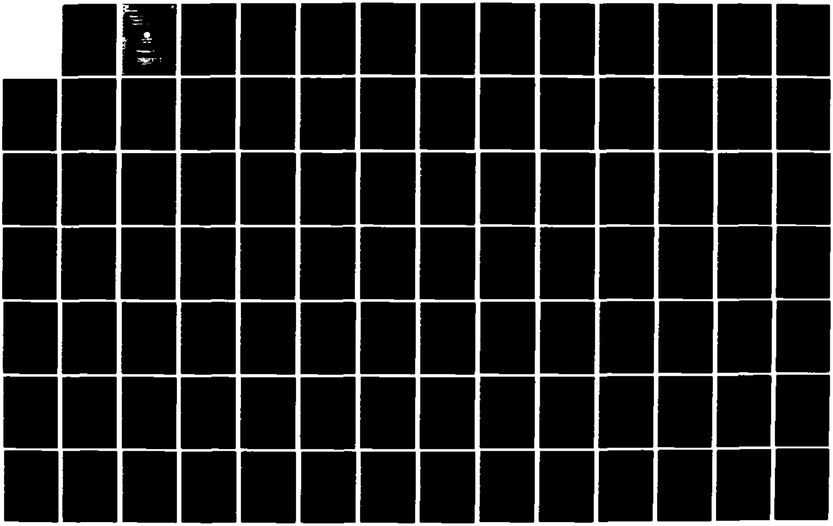
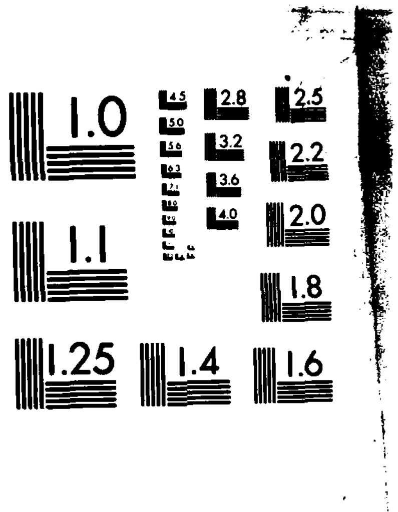
AD-A133 111 COST-BENEFIT ANALYSIS OF POSSIBLE US ADHERENCE TO TWO INTERNATIONAL CONVE..(U) TEMPLE BARKER AND SLOANE INC LEXINGTON MA 30 JUN 83 USCG-WER-83-1 DTCG23-82-C-5984 1/4

UNCLASSIFIED F/G 6/6 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AD-A133111

Technical Report Documentation Page

1. Report No. CG-WER-83-1	2. Government Accession No. AD-A133111	3. Recipient's Catalog No.
4. Title and Subtitle Cost-Benefit Analysis of possible U.S. Adherence to two International Conventions on Liability and Compensation for Oil Pollution Damages - Final Report		5. Report Date June 30, 1983
		6. Performing Organization Code G-WER/12
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address Temple, Barker & Sloane, Inc. 33 Hayden Avenue Lexington, Massachusetts 02173		10. Work Unit No. (TRAIS)
		11. Contract or Grant No. DTCG 23-82-C-5984
12. Sponsoring Agency Name and Address Department of Transportation United States Coast Guard Office of Marine Environment and Systems Washington, D.C. 20593		13. Type of Report and Period Covered Final Report
		14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This report assesses the benefits and costs to the United States of adhering to two international conventions on oil pollution liability and compensation. These conventions are:

- CLC--The 1969 Convention on Civil Liability for Oil Pollution Damage, which governs the tanker owner's liability for oil pollution damage in nations that have ratified the convention.
- FUND--The 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, which provides supplemental compensation in member states.

This report presents the results of the cost-benefit analysis. The primary question addressed is whether adherence to one or both of the conventions would be in the interests of the United States as a nation. Both monetary costs and benefits, and broad non-monetary factors, are included in the analysis. A secondary issue addressed is the distribution of costs and benefits among different groups in the United States, particularly petroleum product consumers, industry, and government.

17. Key Words Oil Pollution, Oil Pollution Liability CLC, Fund, International Conventions Civil Liability for Oil Pollution Damage, Oil Spill Compensation	18. Distribution Statement Document is Available to the U.S. Public Through the National Technical Information Service Springfield, Virginia 22161

19. Security Classif. (of this report) UNCLASSIFIED	20. Security Classif. (of this page) UNCLASSIFIED	21. No. of Pages 360	22. Price

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

The contents of this report do not necessarily reflect the official view or policy of the Coast Guard; and they do not constitute a standard, specification, or regulation.

This report, or portions thereof may not be used for advertising or sales promotion purposes. Citation of trade names and manufacturers does not constitute endorsement or approval of such products.

TABLE OF CONTENTS

CONTENTS
(continued)

CONTENTS
(continued)

INTRODUCTION

The purpose of this report is to assess the benefits and costs to the United States of adhering to two international conventions on oil pollution liability and compensation. These conventions are:

- CLC--The 1969 Convention on Civil Liability for Oil Pollution Damage, which governs the tanker owner's liability for oil pollution damage in nations that have ratified the convention.

- FUND--The 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, which provides supplemental compensation in member states.

The provisions of both conventions are currently under review by the Legal Committee of the International Maritime Organization, and substantial changes may be made at a diplomatic conference scheduled for 1984.

The United States participated in the original drafting of both conventions, but has not ratified them. Presently, legislation has been introduced in the U.S. Congress which addresses the adoption of these two conventions. In light of the strong interest in improving the legislation in the area of oil pollution liability and compensation, the U.S. Coast Guard has commissioned this study to examine the advantages and disadvantages of adhering to the conventions.

This report presents the results of the cost-benefit analysis. The primary question addressed is whether adherence to one or both of the conventions would be in the interests of the United States as a nation. Both monetary costs and benefits, and broad non-monetary factors, are included in the analysis. A secondary issue addressed is the distribution of costs and benefits among different groups in the United States, particularly petroleum product consumers, industry, and government.

The potential outcome for the United States under the CLC and FUND Conventions is compared against the existing situation. At present, there are two voluntary industry agreements that broadly parallel CLC and FUND. These are:

- TOVALOP--The Tanker Owners' Voluntary Agreement Concerning Liability for Oil Pollution Damage, which was

established in 1969 as the shipowning industry's equivalent to CLC.

- CRISTAL--The Contract Regarding Interim Supplement to Tanker Liability for Oil Pollution, created in 1971 as the oil industry's equivalent to FUND.

These voluntary agreements apply to most tanker spill incidents in the U.S. and worldwide. In the United States, liability and compensation for oil pollution damage caused by oil tankers and tank barges is governed by a variety of federal and state statutes, and legal theories.

In Part I, this report analyzes a variety of legislative alternatives involving the two conventions, the voluntary industry agreements, and U.S. legislation. Outcomes are tested under varying assumptions regarding possible revisions to the regimes, differing oil spill scenarios, cost escalations, and currency fluctuation. The alternatives are compared on the basis of a group of seven general objectives.

In Part II, the underlying technical analysis is presented. This involves the development of data on oil spill experience, the legal and insurance situation, seaborne oil movements, and the economics of oil transportation and distribution.

A briefer version of the entire analysis is presented in a separate Executive Summary.

PART I

EVALUATION OF BENEFITS AND COSTS

This part of the report examines the costs and benefits to the United States of ratifying the CLC and FUND Conventions. Although the action being considered in this case is legislative rather than regulatory, the guidelines established in Executive Order 12291 for regulatory impact analyses have generally been followed. The costs and benefits of adherence are compared to the present situation and to other alternatives available to the United States. This comparison is based on how effectively each alternative fulfills a number of legislative objectives. The sections that follow first describe the legislative objectives and alternatives selected for this analysis, and then summarize the comparison of the alternatives in terms of these objectives. Readers who are not already familiar with the international oil spill liability and compensation regimes may wish to refer to Part II before reading Part I.

A. LEGISLATIVE OBJECTIVES

Each alternative available to the United States will have a range of monetary and nonmonetary consequences. In some cases, these consequences are difficult to compare because they involve, for example, a tradeoff of relatively tangible costs such as an increase in contributions to an oil spill compensation fund against the less tangible benefits of increased protection in the event of a catastrophic spill or an increase in U.S. influence in international forums. The alternatives will therefore be compared in terms of their effectiveness in meeting a range of objectives.

The major legislative objectives selected for evaluating each alternative are as follows:

- Net Monetary Cost--The net monetary cost of an alternative consists of the difference between the likely contributions by the United States (or its nationals) to an oil spill compensation fund and the likely compensation to be received by the United States for oil spill cleanup and compensation of damages. Other things being equal, an alternative with a lower net monetary cost is preferable, but the differences in net monetary costs may not justify sacrifices in terms of other objectives.

- <u>Adequacy of Coverage</u>--An oil spill compensation system should adequately cover both cleanup costs and other damages. It should include provisions to cover infrequent but catastrophic spills as well as more routine spills. This coverage can be provided by a combination of regimes, as long as they work together effectively.

- <u>Speed and Certainty of Payment</u>--Parties who clean up oil spills and parties who suffer other damages should be compensated promptly. This helps to avoid financial hardships, avoids tying up funds for long periods of time, and may reduce recourse to lengthy and costly litigation.

- <u>Fairness of Cost Allocation</u>--To the extent possible, the costs of oil spills should be internalized in the cost of oil and borne by oil consumers. Individual groups within society should not be burdened disproportionately relative to other groups.

- <u>Domestic Regulatory Simplification</u>--An oil spill compensation system should contribute to a simplified, rational regulatory framework. It should help resolve existing inconsistencies among the voluntary oil spill compensation regimes (TOVALOP and CRISTAL), federal and state oil spill compensation laws, and case law.

- <u>Predictability and Consistency</u>--An oil spill compensation system should provide a predictable basis for oil companies and shipowners to assess their future costs in terms of both contributions to a compensation fund and oil spill liabilities. Ideally it should also eliminate conflicting international requirements.

- <u>International Influence</u>--An oil spill compensation regime should enhance the influence of the United States in international forums concerned with oil spill control and compensation and other international maritime matters. It should also contribute to international goodwill.

B. ALTERNATIVES CONSIDERED

The relative costs and benefits of ratification may be affected first by future developments that are beyond the control of the United States (for example the phasing out of CRISTAL); second, by changes in the provisions of CLC and the FUND (changes

in limits); and third, by actions of the United States (ratification of CLC alone or CLC and FUND). The alternatives evaluated in this analysis therefore include a broad range of possibilities:

- The Baseline Case--The current situation continues into the future--the United States does not ratify CLC or FUND. Evidence of financial responsibility is required by both the Federal Maritime Commission and TOVALOP, and virtually all oil shipments reaching the United States are covered by CRISTAL. The various funds under U.S. federal and state laws remain unchanged. It is assumed for simplicity that TOVALOP and CRISTAL apply to all U.S. spills.

- The Baseline Case Without CRISTAL--The same situation as above except that the oil companies disband CRISTAL. U.S. oil companies no longer pay contributions to CRISTAL but compensation is no longer available from CRISTAL for U.S. spills.

- U.S. Ratification of CLC and FUND--This is the major alternative discussed in this report. Changes to Federal and state laws are assumed only to the extent that they are required to ensure compatibility with CLC and FUND. The IOPC Fund (the compensation fund established under the FUND Convention) incurs many costs formerly borne by U.S. Federal and state funds, CRISTAL, or recovered through litigation. The United States contributes to the IOPC Fund based on oil received and on spill experience among FUND member-states, and is compensated based on U.S. spill experience. This alternative is assessed both with and without the continuation of CRISTAL, and in the case where the whole world joins CLC and FUND.

- U.S. Ratification of CLC Only--The U.S. ratifies CLC, extending the limitation of liability provisions of CLC to vessels in U.S. waters. This alternative is equivalent to the baseline case with the substitution of CLC for TOVALOP. The alternative is evaluated assuming continuation of CRISTAL.

In addition to these basic alternatives, three sets of important sensitivity analyses have been carried out. These relate to the impact of revised CLC and FUND limits, the impact of different spill distribution

patterns, and the impact of changes in economic conditions.

- U.S. Ratification of CLC and FUND with Revised Limits--Higher FUND limits are evaluated, up to as much as $300 million. At the same time, CLC limits covered by vessel owners' P&I insurance are raised to shoulder more of the burden of non-catastrophic spills.

- Sensitivity of CLC/FUND Ratification to Different Spill Distributions--The U.S. ratifies CLC and FUND, but two additional catastrophic spills are assumed to occur, in addition to the 1970-1980 historical experience. Results are determined for the case where the two spills occur in the U.S., and for the case where they occur in other FUND nations' waters. A test is also made assuming the U.S. does not ratify CLC or FUND, and CRISTAL disbands.

- Sensitivity of CLC/FUND Ratification to Economic Changes--The U.S. ratifies CLC and FUND, but cost factors change the amounts of compensation and contribution involved. In one case, spill claim costs are assumed to be 50 percent higher, in constant price terms, than the historical costs and compensation limits remain constant. Testing another variable, the effect of a U.S. dollar appreciation of 25 percent versus the SDR and of a 25 percent depreciation, are tested.

C. ANALYTICAL METHODOLOGY

Each of the alternatives identified above was tested against the seven legislative objectives. Wherever possible, quantitative measures were developed to provide a common basis for comparing the alternatives. In the following paragraphs, the analytical approach used to evaluate the alternatives against each objective is described.

1. Net Monetary Benefits

The analysis of net monetary benefits was based on a comparison of the compensation that the United States would receive from participaton in an international oil spill compensation regime with the contributions the United States (or U.S. oil receivers) would have to make under that regime. Worldwide compensation, under FUND or CRISTAL, is determined by worldwide

spill experience and the limits applicable for shipowner and cargo interests. Contributions to both FUND and CRISTAL are based on the volume of oil receipts (crude and heavy fuel oils) by a country in the preceding year. Thus, a country's contribution percentage share will be fairly stable, but the amount paid each year varies directly with total world spill experience. Compensation to a country is related to its spill experience. There is, therefore, a potential cost or benefit to a nation by participating in the FUND regime, if spill experience diverges over the long term from the contribution share. The compensation-contribution balance is illustrated in Exhibit Part I-1. The net monetary benefit of joining FUND is further complicated by the fact that CRISTAL does not pay in situations where costs are covered by FUND.

Contributions and compensation under CRISTAL and the IOPC Fund were examined using a database of 146 major tanker oil spills worldwide over the 1970-1980 period, data developed by TBS on U.S. and worldwide oil movements, and analysis of the provisions of each compensation regime. Actual spill claims data and estimated provable damages were converted to 1982 dollars for the analysis, using the OECD's index of inflation for industrialized nations. The components of the analysis are described in detail in Part II.

2. Adequacy of Coverage

This objective is measured by the degree to which the liability and compensation funds applicable to a spill succeed in fully covering the cleanup and damage costs. The liability and compensation limits which apply to the international conventions (CLC and FUND) and to the voluntary industry agreements (TOVALOP and CRISTAL) are shown graphically in Exhibit Part I-2.

The analysis of the adequacy of coverage of each alternative involves a comparison of that alternative's provisions with potential future spill claims. (Spill claims are stated in constant 1982 dollars; therefore, the effect of future inflation in claims amounts on adequacy of coverage is not directly addressed, except in a sensitivity analysis of higher costs.) An important segment of the analysis was a consideration of potential sources of compensation under each alternative. Both U.S. law and the

CLC contain provisions that limit the shipowner's liability. CLC limits the total compensation available for both third-party damages and cleanup to $15.4 million (at end-1982 exchange rates) if the shipowner's liability limit is not broken In the U.S., the FWPCA, the Limitation of Liability Act, and other laws limit a tanker owner's liability. For purposes of this analysis, it was assumed that tank vessels spilling oil in U.S. waters would be covered by TOVALOP, and hence shipowner gross liability would be $16.8 million in the absence of adhering to CLC. The CRISTAL maximum of $36 million and FUND maximum of about $49.6 million (at end-1982 exchange rates) were also applied.

Historically, no spills in U.S. waters have exceeded the FUND limits and only two spills worldwide (the TANIO and AMOCO CADIZ incidents) have exceeded these limits. Therefore, a statement of whether a given set of limits is adequate for the U.S. depends on projections concerning the probability of future catastrophic spills.

TBS has concluded that the most reasonable way to project future oil spills is to look at the future as past. That is, to assume a similar pattern of spills and claims paid as occurred over the 1970-1980 period, converting claims to constant 1982 dollars. While this approach has limitations in the sense that the future will differ from the past due to changes in numerous factors, TBS believes that this is the most meaningful and reliable method to predict these rare occurrences (see Chapter VII). The approach taken, therefore, is a "hindcast" approach, with sensitivity analysis to indicate the significance that a different spill claims distribution pattern would have on the compensation-contribution balance and on adequacy of coverage.

3. Speed and Certainty of Settlement

The public and private oil spill compensation regimes differ significantly in the speed and certainty with which claims are settled. Under the public regime, the shipowner establishes a limitation fund against which cleanup and damage costs can be claimed. The IOPC Fund complements the CLC limitation fund, and in some cases advances compensation even before the case has been settled if financial hardship to victims may result from delays. CRISTAL by contrast provides compensation only after other recourses have been exhausted. This may mean delays while cases are still pending.

To examine the speed and certainty of payment, TBS obtained data concerning the date of settlement of spill claims from CRISTAL and the IOPC Fund. These dates were examined to determine the average time period from the date of an incident to the date of settlement. Analysis of case studies, discussions with the P&I Clubs, insurance adjusters, and representatives of CRISTAL and the IOPC Fund have also been utilized to document these differences.

4. Fairness of Cost Allocation

The fairness of cost allocation of a compensation scheme depends on the extent to which the cost of spills is internalized in the cost of oil and on the extent to which individual groups within society do not bear disproportionate burdens. The contribution formulas under CRISTAL and the IOPC Fund allocate the cost of oil spills to oil shipments. The first layer of liability, under CLC or TOVALOP, is borne by the tanker owner. As noted in Chapter VI, tanker owners and oil companies are able to pass these costs through to consumers, though with some time delay. Federal legislation specific to certain activities such as deep water ports, Outer Continental Shelf oil exploitation, and transportation of Alaskan oil (DWPA, OCSLAA, and TAPA) also allocates costs to the consumer on a per-barrel basis, beyond the initial layer of operator/owner responsibility.

The FWPCA Fund, by contrast, distributes the cost of spills among the general population through increased Federal revenue requirements, to the extent that costs are not recovered from the spiller. Funding out of taxes means that the cost of oil spills is not directly reflected in the cost of oil.

5. Predictability and Consistency

The consistency of alternative compensation regimes was evaluated by comparing U.S. and international regimes. To the degree that a single regime exists in all the major nations, the regime is more consistent. Predictability depends upon the strictness of the regime, the allowable defenses, and the likelihood that local courts will predictably interpret the regime. Predictability is of prime concern to tanker and oil cargo owners.

6. Domestic Regulatory Simplification

The effect of each alternative on the complex U.S. federal and state system for oil spill compensation was based on legal analysis in Chapters I through IV of Part II. This relationship has been accurately described as a patchwork of laws and regulations. To the extent that an alternative merely overlays another system on the already-existing structure, it may add greater complexity. On the other hand, the selection of a particular alternative may be used as an opportunity to rationalize and simplify the existing system. Whether an alternative makes the existing structure more or less complex depends on the manner in which that alternative is implemented, in particular on the implementing legislation that accompanies it.

7. International Influence and Goodwill

The increase in the international influence of the United States resulting from selection of a given alternative depends on the perceptions by other nations of U.S. actions. If U.S. ratification of FUND contributes to its viability and if other nations join FUND as a result of the U.S. action, the U.S. would gain international goodwill. By joining the FUND, the U.S. would also be able to participate in the FUND Executive Committee, and would also play an important part in the FUND Assembly. The U.S. role in shouldering part of FUND's financial burden and in simplifying the legal environment for shipowners might provide positive international political benefits for the U.S.

D. EVALUATION OF ALTERNATIVES

This section describes the evaluation of each alternative in terms of the objectives described earlier.

1. Baseline Case

This is the status quo, in which the United States does not join either CLC or FUND and the existing U.S. oil spill compensation regime remains in force (with CRISTAL continuing). Tanker owners are required by the Coast Guard (formerly by the Federal Maritime Commission) to maintain insurance of $150 per GRT (for barge owners, $125 per GRT) and they are responsible under the FWPCA for cleanup costs up to that level. Cleanup costs are paid by the spiller or the FWPCA Fund, and are either recovered from the spiller or financed out of Congressional appropriations.

Third party damages are recovered under maritime tort or nuisance theories, common law, subject in some instances to the Limitation of Liability Act. While some third party damages are also recoverable under the activity-specific DWPA, TAPA and OCSLAA statutes, this possibility has not yet been exercised in practice.

For the monetary analysis, TOVALOP limits and CRISTAL coverage are assumed to apply to all tanker spill incidents in U.S. waters, whereas in practice, they cover over 90 percent of the tank vessels and oil cargoes under consideration. This is a conservative approach to the analysis of alternatives, since it slighlty overstates the coverage (and compensation) available at present under the baseline case.

Net Monetary Cost

The baseline alternative assuming continuation of CRISTAL would involve a small net monetary benefit cost to U.S. oil consumers, because United States oil companies would contribute less to CRISTAL than the expected compensation received by victims for spills taking place in U.S. waters.

Analysis of the 1970-1980 oil spill compensation database was performed using current TOVALOP/CRISTAL conditions and constant 1982 dollars. The key conditions are: (1) $1 million shipowner minimum liability, (2) $16.8 million maximum shipowner liability, (3) $36 million maximum ceiling on combined TOVALOP/CRISTAL funding. It is also assumed that all ships causing spills in U.S. waters are eligible for CRISTAL rollback, and that all oil spilled would be entered under CRISTAL.

The results show that the U.S. would receive $62.7 million in compensation from CRISTAL (Exhibit Part I-3). Compared to U.S. oil company contributions of $50.0 million to CRISTAL, the net benefit would be $12.7 million to the U.S. over an 11-year period. This equates to approximately $1.2 million per year in net benefits.

The U.S. contribution to CRISTAL is based upon 28.4 percent of the world's CRISTAL oil during the 1970 to 1980 period (Exhibit Part I-4). The 28.4 percent U.S. contribution share is computed from U.S. oil receipts and its participation in persistent oil transportation and spill exposure during this period. In recent years, U.S. shares of CRISTAL oil have been about 31 percent, but variation in U.S. and world petroleum production and logistics during the 1970 to 1980 period make the 28.4 percent figure appropriate.

Adequacy of Coverage

The level and certainty of spill coverage available in the U.S. at present cannot be considered adequate. This is despite the fact that no U.S. spills during the 1970-1980 period exceeded the CRISTAL limits. Due to oil transportation patterns, high safety standards, and a certain amount of luck, the U.S. has not yet suffered a spill of large proportions in a sensitive area. Such a spill could occur, and could result in damages and costs of $200 to $300 million. This is many times the $36 million available under CRISTAL. Also, CRISTAL does not cover every cargo in U.S. waters; for instance, the BURMAH AGATE spill was not a CRISTAL cargo and hence was not covered. Thus, third-party damages--as opposed to spill cleanup costs--are not adequately covered, in addition to certain funding problems of the FWPCA's Section 311 K spill cleanup revolving fund.

In discussing the adequacy of pollution damage coverage in the baseline case it is necessary to differentiate between clean-up costs and third party damages. Oil spill cleanup is covered under section 311 K of the FWPCA which establishes a cleanup fund authorized at $35 million. The fund has not been maintained consistently at its authorized level; in fact, it has been depleted on one occasion and was seen dangerously low several other times. Its balance was $24.7 million at end FY1982. If the fund were at a low level when a spill occurred, the Coast Guard might have inadequate funding available for a complete cleanup. Additional funding could be obtained by Congressional appropriation or action, but a delay would likely result.

Compensation for third-party damages is a more serious problem with the present system. There are no general federal statutes providing for liability and recovery of third-party claims involving oil spills. However, the activity-specific statutes (DWPA, TAPA, OCSLA) do cover third-party damages, as do several coastal states' laws. Maritime tort or maritime nuisance theories and common law are the alternatives available to the claimant, and these require costly and time-consuming legal processes. Further, the Limitation of Liability Act establishes a level of general maritime liability which is very low if the vessel is seriously damaged during the incident. The legal right to an adequate recovery is thus not guaranteed.

The two voluntary industry schemes do improve the level of compensation available for oil spill victims. TOVALOP covers both cleanup costs and third-party damages, but is limited to

$16.8 million. CRISTAL raises the total available to $36 million, but only as a last recourse and for cargoes covered by CRISTAL. CRISTAL has been involved in four United States spills.

Speed and Certainty of Settlement

The current oil spill compensation system is cumbersome in providing compensation for victims. As discussed in Chapter III, the average length of time for CRISTAL to settle claims has been 28.9 months, or 3.7 times the FUND settlement time. For U.S. spills settled under CRISTAL the record has been even slower. The U.S. government has encountered difficulty in recovering its spill cleanup costs from spillers in certain cases. Third-party damage claims settlements under U.S. law have also at times been slow.

Fairness of Cost Allocation

At present, U.S. oil spill costs are not totally reflected in the cost of oil. The complex allocation of spill costs reflects the patchwork of liability regimes and compensation funds.

The major law governing cleanup liability--FWPCA--relies on federal appropriations and subsequent recovery from the spiller. Over fiscal years 1971-1982, the U.S. government obligated $124 million from the FWPCA revolving fund for oil and hazardous substance cleanup on land and on water. (It has not been possible to obtain data referring only to those incidents involving seagoing tank vessels.) About $49 million was recovered from spillers, leaving a $75 million net cost to taxpayers over a 12-year period. Thus, oil spill cleanup costs are not exclusively paid by oil consumers because one of the major statutes is based upon appropriations rather than on a per-barrel fee.

The three specialized activity-specific funds--Deepwater Port, Outer Continental Shelf, and Trans-Alaska Pipeline--are nourished by levies on oil shipments. However, none of these funds have yet been called upon to finance ocean oil spill cleanup actions. Money has been collected and invested, but the only expenses so far (for administration) have been covered by interest on the funds in hand. The cost allocation mechanism embodied in these funds is sound, but has not been utilized due to the limited nature of the coverage provided.

CRISTAL is also available in the U.S., although it has not been of major importance in practice so far, because of the modest claims experience so far.

The present system also imposes considerable costs on the victims of oil spills. Going to court to prove damages based on maritime tort or nuisance theories or common law is an expensive and time-consuming process. If the vessel owner is able to limit his liability under the Limitation of Liability Act, and the vessel is of limited value after the incident, the victim may have no means to recover damages.

Projecting the future based on U.S. spill occurrences during 1970-1980, and assuming all spills were CRISTAL cargoes, 49 percent of U.S. claims would be covered by shipowner liability (TOVALOP) and 51 percent by CRISTAL. There would be no uncompensated damages. Oil companies in the U.S. would contribute an average of $4.6 million per year to CRISTAL, or 0.15 cents per barrel of assessment oil. Applying the worldwide spill experience over the same period to the U.S., shipowners would pay 43 percent, CRISTAL 54 percent, and 3 percent would remain uncompensated.

Domestic Regulatory Simplification

A key problem with the present system is the complex and frequently contradictory nature of federal and state legislation dealing with oil spills. This legislation is described in detail in Part II and in Appendix A. Maintaining the present system would mean retaining this unwieldy structure.

Predictability and Consistency

The present situation subjects oil companies and oil transporters to diverse oil spill regimes. The United States maintains a system where the liability of the shipowner for oil spill damages is unclear, fluctuating between the low Limitation of Liability Act limits and the possibility of a court denying the owners' right to limitation. By not adhering to CLC and FUND, the U.S. weakens the chances of achieving a unified international approach to liability and compensation.

International Influence and Goodwill

If the United States does not ratify the CLC and FUND Conventions, it will limit its ability to influence future CLC and FUND decisions concerning matters such as liability under CLC and the IOPC Fund limits. In particular, decisions pertaining to CLC limits affect U.S. interests. For example, a proposal currently under consideration could prevent a U.S. parent company from being sued in U.S. courts for a spill in a CLC member-country's waters by channelling all liability to the vessel owner. Thus, the U.S. can be affected even without adhering to CLC or FUND.

By not ratifying CLC and FUND, the United States may also forego international goodwill. Western European nations and Japan are the major backers of FUND. These countries regard United States participation as important for the viability of FUND. In addition, failure by the United States to ratify CLC and FUND may mean that other nations will also not ratify.

2. Baseline Case if CRISTAL Disbands

Under this alternative baseline, the oil companies which currently operate CRISTAL would disband this regime. The results are similar to the baseline case in terms of all but three objectives--net monetary cost, adequacy of coverage, and fairness of cost allocation. Therefore, only these objectives are discussed below.

Net Monetary Cost

As Exhibit Part I-3 shows, if CRISTAL were disbanded, there would be no monetary costs or benefits to CRISTAL. The U.S. would not receive the $62.7 million CRISTAL compensation projected under the base case, but would also save contributions of $50.0 million. This baseline is slightly less favorable to the U.S. than if CRISTAL continues, since the baseline case indicates a net monetary benefit of $12.7 million over the eleven-year period.

Adequacy of Coverage

The likelihood of CRISTAL's termination has a strong impact on the adequacy of coverage under the baseline case. While CRISTAL has not been an important source of compensation for U.S. spills in the past, its demise would remove the broadest coverage of third-party claims presently available. The FWPCA covers only government cleanup costs, and the remaining federal and state funds are activity-specific and have been little used. Therefore, CRISTAL's demise would essentially leave the U.S. without any broad-based recourse above owner's liability, which would be defined by FWPCA for cleanup costs and by the Limitation of Liability Act and the courts for third-party claims.

Fairness of Cost Allocation

CRISTAL provides a potential source of compensation for third-party damages. Elimination of CRISTAL would mean that this source of compensation for third-party damages would no longer be available and would increase the share of costs potentially borne by spill victims. Eliminating the complete CRISTAL coverage assumed earlier, 51 percent of U.S. spill costs would be uncompensated.

3. Ratification of CLC and the IOPC Fund Conventions as They Currently Exist

Under this alternative, the United States would ratify the CLC and FUND Conventions making only such changes to domestic legislation as would be necessary to ensure compatibility with FUND. As to oil pollution damage by seagoing tankers and tank barges, the limitation of liability provisions of CLC would supersede the Limitation of Liability Act and the IOPC Fund would provide for recovery of cleanup costs presently covered by Section 311 K of the FWPCA. There would be slight changes in current liability limits because the FWPCA has a limit of $150 per GRT for tankers (equivalent to $167 per convention ton) with a minimum of $250,000, while CLC limits liability to the equivalent of $147 per convention with a maximum of about $15.4 million.

Net Monetary Cost

In this case, the U.S. is assumed to ratify CLC and FUND with their current provisions. All ships that cause pollution incidents are assumed to be registered in countries that have ratified FUND. This maximizes FUND's liability due to the rollback provision.

The U.S. would experience a projected net cost of $3.1 million per year under this scenario, assuming continuation of CRISTAL and current FUND membership (Exhibit Part I-3). This cost is derived as follows:

If the U.S. joined FUND with its present membership, expected compensation to the U.S. (monetary benefits) of $68.1 million over 11 years would very nearly balance contributions (monetary cost) of $70.0 million over the same period. This cost includes the initial U.S. contribution to the FUND ($1.5 million, as explained in Exhibit Part I-5) amortized over an 11-year period. If CRISTAL were to be disbanded following U.S. adherence to the FUND, the net cost to the U.S. would thus be only $0.2 million per year.

If, however, CRISTAL were to remain in operation, the net cost to the U.S. would be considerably higher, since U.S. oil companies would continue to contribute about 28 percent of CRISTAL's outlay, which would be going exclusively to countries other than the U.S. since we would be covered by FUND. Adding this continuing CRISTAL cost to the small net cost of FUND, the U.S. would incur total net costs of $3.1 million per year.

If the entire world joined FUND, the U.S. would pick up 28 percent of the bill, and considerable additional spills would be added. On the other hand, CRISTAL would by definition cease to exist. Therefore, the net cost to the U.S. would be $3.3 million per year, as Exhibit Part I-3 shows.

Adequacy of Coverage

In relation to historical spill experience in the U.S., adoption of CLC and FUND with their current limits would improve the adequacy of coverage in certain respects. First, the FUND limit (about $50 million) is 39 percent higher than the CRISTAL limit. Second, FUND would provide a more complete coverage than CRISTAL, which applies only to cargoes entered in CRISTAL.

Compared to the baseline case without CRISTAL, CLC/FUND would provide even better coverage. Cleanup (as well as damage) costs of up to $50 million would be covered by CLC/FUND, as opposed to only $7.5 million for a 50,000 GRT tanker under FWPCA. Third-party damages would be covered at a level that has not been approached by any tanker oil spill in U.S. waters to date. Under the current situation, there is no clear and general statutory basis for recovery of third-party claims.

Viewed in the context of world oil spills, the coverage provided by the present FUND limits is insufficient for a catastrophic spill. However, no such spills have occurred in U.S. waters to date. The AMOCO CADIZ case involves claims of over $2 billion, and provable damages have been estimated to range between $150 and $350 million. The TANIO case also involves claims in excess of FUND limits (about $72 million in 1982 dollars). In other cases, such as the ANTONIO GRAMSCI and the INDEPENDENTA, claims have exceeded the FUND limit as well. The FUND limit is clearly low in relation to the typical $300 million in oil spill insurance provided by P&I Clubs.

Two areas of possible concern relate to the geographical scope of CLC/FUND and to the coverage of environmental damage. FUND coverage is restricted to the territorial sea of the member state, while the trend in recent federal legislation has been to include the 200-mile exclusive economic zone. This could be a problem in combination with the lack of pure threat coverage: the U.S. might take steps to prepare for oil reaching the territorial sea, which could go uncompensated in the event the oil never reached U.S. territory.

In the wake of the ANTONIO GRAMSCI case, the FUND established a policy of paying only for quantifiable economic damage. This standard differs from the judicial precedent in the ZOE COLOCOTRONI case, in which the U.S. Court of Appeals recognized the possibility of compensable environmental damages beyond quantifiable economic losses.

Speed and Certainty of Settlement

The CLC/FUND regime would represent a substantial improvement over the current situation in terms of the speed and certainty of claims settlement. It might also result in reduced litigation costs. The average length of time between an incident and the FUND settlement is about eight months, with the longest time period being 13 months. In addition, partial settlements are possible at the Fund Director's discretion in cases where financial hardships to victims might result from delays. By contrast, under CRISTAL this time period is 29 months, largely because CRISTAL provides compensation as a last recourse after all other sources of compensation have been exhausted.

In the United States, oil-spill cleanup has not been delayed significantly by the unavailability of funds because the Coast Guard has taken responsibility for cleanup when private parties have been unwilling to accept responsibility. The 311K fund provides monies for clean-up, although this fund has become

depleted from time to time pending additional Congressional appropriation. On the other hand, final settlements have been very significantly delayed by extensive litigation surrounding major spills such as the NEPCO 140, the ZOE COLOCOTRONI, and the HYGRADE 95. Although in some cases delays due to litigation would persist, it is likely that claims settlement would be much more rapid under FUND than it is at present.

Certainty of settlement would be enhanced as well. The CLC establishes a single liability regime for cleanup and third-party damages, which does not exist in the U.S. at present. It thereby creates a much more certain definition of shipowner's liability. The FUND is also much more certain than the only compensation fund broadly available in the U.S.--CRISTAL. CRISTAL was not available in the BURMAH AGATE case, for instance, because the oil was not a CRISTAL cargo at the time of the incident. The FUND has only been involved in one legal case where its coverage has been disputed, the TARPENBEK incident involving prespill preventive measures.

Legal costs might be greatly reduced, since both CLC and FUND provide clear administrative means to settle claims. Litigation can be very expensive as well as time consuming; it has been estimated that $40 million or more has been spent on legal costs in the AMOCO CADIZ case so far on the issue of liability alone.

Fairness of Cost Allocation

The CLC/FUND system as presently constituted would allocate about 29 percent of worldwide spill claims cost to shipowners, 50 percent to oil cargo receivers, and 21 percent to the spill victims as uncompensated damages. These percentages are based on the 146 spill database constructed for the 1970-1980 period and do not include spills resulting in claims of less than $250,000, which are exclusively borne by the shipowners.

U.S. spill experience indicates that the oil receivers would pay for 55 percent of spill costs under FUND, and shipowners would pay the other 45 percent under CLC. The U.S. oil cargo receivers and oil companies would make annual contributions to FUND and CRISTAL totalling $9.3 million, or 0.30 cents per barrel for the 444 million tons of contributing oil received annually, versus oil company payments of 0.15 cents per barrel to CRISTAL under the present situation. In general, these oil receivers are either large oil companies, public utilities, or independent terminal operators. Since FUND contributions are only levied on terminals receiving at least 150,000 tons of crude or heavy oil per year, there would be a minimal cost impact on small terminal operators.

The system established under FUND for assessing contributions internalizes the cost of oil-spill cleanup in the cost of petroleum products. As discussed in Part II, the types of persistent oils on which fees are based are those for which additional costs are likely to be passed through to the ultimate consumer.

Domestic Regulatory Simplification

Adoption of CLC/FUND would not of itself resolve the continuing conflicts between state and federal laws, consistency in definitions and standards, and the role of the Limitation of Liability Act. While shipowner liability would be simplified, the existing laws would presumably continue to impose varying levels of liability upon other dischargers, such as terminal owners, bareboat charterers and operators, and third-party causes of discharges. The IOPC Fund is also not identical to the existing federal funds which would remain in place for certain applications.

Adoption of the CLC and FUND Conventions by the United States through accession would necessarily involve the United States Congress in implementing legislation. It therefore provides an opportunity to address the issue of the creation of one overall regime for U.S. oil spill liability and compensation. Adoption would simplify the situation in terms of shipowner liability and a broad supplementary compensation fund, and would focus attention on the need for other changes as well.

Predictability and Consistency

Ratification by the United States of the CLC and FUND Conventions would contribute to a predictable and consistent worldwide oil-spill compensation environment for oil companies and tanker owners. The existing inconsistency between the United States and the other major oil-importing and shipowning nations of the world would be eliminated and oil companies and shipowners would be subject to a single system of liability and contributions. This would be particularly true to the extent that U.S. ratification caused other nations to join FUND, and CRISTAL to be eventually disbanded.

International Influence and Goodwill

Ratification of CLC and FUND would increase United States influence in future CLC/Fund decisions, enhance the U.S. negotiating position in similar international situations, and increase international goodwill toward the United States. As a member of CLC and FUND, the United States could take an active and influential role in the determination of future policies. Some of the major issues currently facing the FUND, which the United States might influence, include the setting of revised FUND limits, extension of coverage to nonpersistent oils, channelling of liability under CLC, and compensation for environmental damages. Full influence in these decisions would require U.S. membership prior to the planned 1984 diplomatic conference.

Adoption of CLC and FUND would enhance the credibility and strength of the United States in other international negotiations as well. The U.S. has so far adopted only one of the seven international conventions adopted by the Legal Committee of the IMO. This contrasts with the strong U.S. record with conventions adopted by the Marine Safety and Marine Environmental Committees of the IMO. The ability of the U.S. to influence the outcome of other conventions which are being discussed within the Legal Committee--including revisions to the 1910 Salvage Convention and a convention on hazardous and noxious substances--would be increased by adopting CLC and Fund which are widely believed to correspond with U.S. policies.

In terms of international goodwill, U.S. ratification would ensure the long-run viability of FUND, and possibly lead to ratification by additional states. A number of countries which have not yet adhered to FUND may be influenced by U.S. adherence. By ratifying FUND, the United States would be furthering the interests of Western European nations and Japan.

Japan would be particularly pleased, since it is presently bearing a high proportion of the FUND's cost (31.3 percent in 1981) while receiving only 9.7 percent of FUND compensation (Exhibit Part I-9). Japan may be reluctant to adopt higher revised FUND limits without U.S. accession to FUND. It has been bearing a heavy share of the FUND burden, which it always believed the U.S. would share. United States adherence to FUND would reduce Japan's share from 31.3 percent to 21 percent, on a 1981 basis. Japan's share of compensation would decline to 6.8 percent.

The impact of ratification on U.S. standing in the international shipping community must also be considered. As Exhibit Part I-6 shows, 87 percent of the world's tanker fleet is

registered in nations that have ratified CLC, and 69 percent of the world's tanker fleet is registered in nations that have ratified both CLC and FUND. The U.S. has 5 percent of the world's fleet and the other nations of the world that have not ratified CLC account for the remaining 8 percent of the world's fleet. The U.S. operates the largest fleet that has not registered the CLC Convention.

Ratification of CLC by the U.S. would be likely to enhance its position in the international shipowning community, by helping to extend a uniform international system of tanker oil pollution liability. If the U.S. were to ratify CLC, the Convention would include all of the major industrial nations and more than 90 percent of the world's fleet. If the U.S. were to ratify FUND, nearly 75 percent of the fleet would be registered in FUND nations. If Greece, Panama, and the U.S.S.R. ratified in addition to the U.S., FUND nations would register 90 percent of the world's tanker fleet.

4. Ratification of CLC Only

The U.S. could choose to ratify only the shipowner's liability regime established under CLC, without joining FUND. This option would not resolve certain of the key problems at present; on the other hand, it would involve little or no cost except for the continuing U.S. contribution to CRISTAL.

Net Monetary Cost

The net monetary benefit would be virtually the same as under the base case--$1.3 million per year versus $1.2 million per year under the baseline, current situation (see Exhibit Part I-3). This is because the CLC limits are very similar to those currently available under TOVALOP, assuming that all tankers are entered in TOVALOP.

Adequacy of Coverage

From a spill victim's point of view, adhering to CLC alone would improve the ability to recover spill cleanup and third-party damage claims from the shipowner. For cleanup, the CLC limit of about $147 per convention ton is slightly less than under the FWPCA (equivalent to $167 per convention ton), and is limited to a maximum of about $15.4 million. The FWPCA liability is limited only by the actual size of tankers. The CLC limit is reached at a vessel size equal to 92,000 convention tons; this corresponds to a tanker of about 220,000 DWT, essentially the

largest size tanker currently entering U.S. waters and representing a small portion of total oil movements in U.S. waters. Third-party claims would be better covered in a legal sense than at present, since--up to the shipowner's limit--liability would be established by statute. However, TOVALOP is generally available for vessels trading to the U.S., and its limits ($160 per convention ton up to a maximum of $16.8 million) are very similar to those of CLC.

Coverage would be available up to CRISTAL limits. Thus, it would not be adequate for catastrophic spill coverage as experienced in other parts of the world.

Speed and Certainty of Payment

Joining CLC might have a positive impact on the speed and certainty of recovery from shipowners. This is because the shipowner himself can recover against the CLC limitation fund he establishes, whereas this is not the case with the FWPCA 311 k fund. The spiller may therefore be more willing to promptly undertake the cleanup effort himself.

The clearer liability established by CLC would make recovery from shipowners more certain as well. TBS is not aware of any case to date in which the shipowner was unwilling to establish his limitation fund, although this has been very slow in one case (the JOSE MARTI in Sweden).

Fairness of Cost Allocation

In essence, the cost allocation would not be improved compared to the present situation. Under CLC, about 47 percent of the cost of all U.S. spills would be paid by shipowners and the remaining 53 percent would be paid by CRISTAL.

Domestic Regulatory Simplication

CLC would establish a clear liability regime for tanker owners, and this would represent a considerable improvement over the present situation. On the other hand, CLC does not simplify the liability of non-owner parties, and it does not introduce a compensation fund.

Predictability and Consistency

Predictability would be enhanced from the shipowner's viewpoint, and the U.S. would become consistent with the other 51 members of CLC.

International Influence

Adhering to CLC and not to FUND would be likely to send a conflicting signal to the international community which could well diminish goodwill toward the U.S. Such a step might imply that the U.S. was rejecting the FUND Convention, and was adopting CLC because there was no financial implication as there would be under FUND. CLC already counts 51 member states, and will clearly continue whether the U.S. joins or not. FUND, on the other hand, is sensitive to the U.S. position as a potential large contributor. Thus, the pro-active step of joining CLC and implicitly rejecting the FUND could do more damage to the future of the FUND--and U.S. relations with its Japanese and European allies who are members of FUND--than retaining the present situation of non-adherence to either convention.

5. Ratification of CLC and FUND with Revised Limits

Revised limits for CLC and FUND are currently being discussed by the IMO Legal Committee. The U.S. has in the past expressed its interest in a higher combined limit, to ensure adequacy of coverage for major spills. TBS has therefore analyzed several hypothetical revised liability limits for CLC and FUND to determine their potential attractiveness from a U.S. viewpoint. The alternatives selected represent TBS's judgment as to the likely range of alternatives that might be suggested for consideration by CLC and FUND members.

These alternatives can be viewed as sensitivity analyses to the U.S. ratification of CLC and FUND with current limits. Continuation of CRISTAL and current FUND membership is assumed. The results differ from those under present limits in terms of net monetary costs, the adequacy of coverage, and the fairness of cost allocation.

Five different liability limit patterns have been analyzed, as presented graphically in Exhibit Part I-7. The key characteristics of the five cases are as follows:

Characteristic	Current Limits	Case A	B	C	D	E
Shipowner Minimum, $M	0	1	5	5	10	50
Shipowner Maximum, $M	9.2/15.4	20	20	35	50	50
FUND Maximum, $M	49.6	75	100	200	300	300
CLC Rate per Convention Ton	110/147	250	400	600	1,250	flat tranche

The cases range from a modest increase in limits to $20 million for the shipowner and $75 million overall, to shipowner liability of $50 million and $300 million overall. All cases would eliminate rollback, to simplify the analysis.

Net Monetary Costs

The results demonstrate that the FUND would impose an increasing net cost on the U.S. as the level of FUND coverage increases (Exhibit Part I-8). However, the maximum net cost is still small--$8 million per year.

Compared to the situation under present limits--net cost of $3.1 million per year with continuation of CRISTAL--the increment in cost to the U.S. is modest for the enhanced coverage obtained. The cost of raising the FUND maximum, which is of prime concern from a spill victim's viewpoint, would be partially offset under these alternatives by raising the shipowner's limit. For instance, under Case C, total coverage would be raised from $49.6 million to $200 million, while the net cost to the U.S. would approximately double from $3.1 million per year to $7.7 million.

The possible outcome of discussions on revised limits cannot be predicted, but TBS believes that the cases analyzed bracket the range of likely possibilities and of potential net monetary cost to the U.S.

Adequacy of Coverage

Past U.S. spill experience during the 1970-1980 period shows that even current CLC/FUND limits would have adequately compensated spill victims. From a world spill experience viewpoint, a $75 million FUND maximum (similar to what could already be

adopted by vote of the FUND Assembly) would cover all but one out of the 146 spills--the AMOCO CADIZ. A maximum of $200 million would cover all spills which have occurred worldwide to date, assuming an AMOCO CADIZ settlement at the low end of the spectrum of probabilities. The $300 million limit should provide good coverage of catastrophic spills at the present time, but does not take future inflation into account.

Fairness of Cost Allocation

The allocation of total costs between shipowners, oil receivers, and spill victims varies with the limits assumed (Exhibit Part I-8). In general, as shipowner limits are raised, the FUND's share of total costs is diminished. The shipowners' share would range from 40 percent to 71 percent of total FUND member-country spill costs for the five cases studied, versus 25 percent at present limits. FUND share would range from 29 percent to 49 percent (45 percent presently), and victims' share would range from 0 percent to 20 percent (30 percent presently). Exhibit Part I-8 sets out the cost allocation of the various revisions.

The allocation of costs for spills in all FUND member-country waters (including the U.S. in these projected alternatives) illustrates the potential for disagreement between tanker owners and oil receivers over the levels of revised limits. At present limits, the oil receivers bear the heaviest share (45 percent), with shipowners covering 25 percent and the remaining 30 percent uncompensated. The concept of a high flat tranche for shipowners' liability ($50 million) would reverse the balance, leaving the shipowners with 71 percent of total costs and the oil interests with the remaining 29 percent (using the limits assumed in Case E, Exhibit Part I-8). Case C, based on shipowner liability rising from $5 to $35 million for a 58,300 convention ton vessel, with a FUND maximum of $200 million, would eliminate uncompensated claims while keeping shipowners' liability close to 50 percent of total costs.

Although shipowners' P&I costs would rise with higher CLC limits, the additional cost involved does not appear large (see Exhibit Part I-9). This Exhibit shows total annual P&I costs, with present CLC limits, varying from $32,500 for a 7,500 DWT tanker to $124,000 for a 265,000 DWT tanker. Oil pollution insurance costs are only a portion of total P&I costs. Utilizing the spill database, total dollar increases for all tankers were computed. Since it is not known exactly how the P&I Clubs allocate pollution insurance costs across different vessel sizes, two hypotheses were tested: (a) that pollution liability costs are

allocated directly in proportion to ship's tonnage (GRT), and (b) that costs are allocated on a flat per-ship basis. These two hypotheses may bracket the actual practice, although for small vessels, the actual amount could be higher than either hypothesis indicates. The figures show that, in general, total P&I costs would increase by no more than 15 percent for any vessel size. Under the alternative (Case E) with the highest tanker owner liability ($50 million flat tranche), annual P&I costs would rise by an average of $3,000 per tanker. This amount is a small fraction of one percent of a tanker's annual operating costs.

U.S. oil cargo owners' and receivers' costs would also be different under the revised CLC/FUND limits (Exhibit Part I-9). At present, U.S. oil cargo owners pay about $0.0015 per barrel of CRISTAL oil. With present CLC/FUND limits, U.S. oil cargo owners would pay $0.0009 per barrel under CRISTAL, and U.S. oil receivers would pay $0.0021 per barrel of contributing oil. Under the five alternatives with revised limits, the oil receivers would pay up to $0.0023 per barrel (Case C). This represents three-tenths of one percent of the average operating costs of a U.S. bulk oil terminal. The U.S. oil cargo owners would continue to pay the same contribution to CRISTAL as under present limits, since CRISTAL costs would not be affected by revised CLC/FUND limits, as long as CRISTAL remains in effect.

Assuming that all oil pollution costs (incurred by tanker owners, oil cargo owners, and oil receivers) are eventually passed through to U.S. consumers, the cost per gallon of petroleum products would rise by about one to two one-hundredths of a cent. This amount is not significant, compared, for instance, with a recent five cents per gallon tax increase on certain petroleum products.

6. Sensitivity of Net Monetary Cost

Given the uncertainty surrounding the future U.S. and world oil spill claims distribution, TBS has analyzed the sensitivity of the net monetary cost associated with U.S. adherence to CLC and FUND to several factors. The sensitivity analysis has assumed current CLC and FUND limits, current membership plus the U.S., and continuation of CRISTAL. The following factors have been addressed:

a. Different spill distribution

(1) One additional catastrophic spill in the U.S., in addition to the 1970-1980 experience, over an 11-year period

(2) Two additional catastrophic spills in the U.S., in addition to the 1970-1980 experience, over an 11-year period

(3) Two additional catastrophic spills in other FUND countries, in addition to the 1970-1980 experience, over an 11-year period

b. Spill claims cost escalation

(1) Costs 50% higher

c. Currency fluctuations

(1) U.S. dollar weak (25% depreciation versus the SDR)

(2) U.S. dollar strong (25% appreciation versus the SDR)

This section briefly describes the outcome of these sensitivity analyses.

a. Different Spill Distribution

Net monetary benefit/cost to the United States is highly sensitive to the assumed distribution of catastrophic spill claim incidents. This is illustrated by considering the addition of two catastrophic spills to the 1970-1980 spill experience (see Exhibit Part I-11). The spills are defined (in Exhibit Part I-10) as one $100 million claim situation, and one $200 million incident, over an 11-year period. In one case, the two imaginary spills are assumed to occur in U.S. waters with continuation of CRISTAL; in the other case, in other FUND nations with CRISTAL still in effect.

Compared with the "hindcast" spill experience, this alternative results in claims of $300 million more, with FUND compensation of $85.3 million. If the spills occur in the U.S., net benefits to the U.S. will be increased by the non-U.S. share of FUND contributions times this amount, or $60.1 million. Thus, the net cost in the "hindcast" case of adhering to CLC/FUND ($3.1 million per year in the "base case") becomes a net benefit ($2.4 million per year, per Exhibit Part I-11). The net benefit would be even greater if we were not assuming continued U.S. contributions to CRISTAL.

On the other hand, if two additional catastrophic spills occur in other FUND countries' waters, the U.S. would be liable for 29.6 percent (see Exhibit I-4) of the resulting $85.3 million FUND compensation. This would change the net U.S. annual cost from $3.1 million to $5.4 million.

If two catastrophic spills were to occur in U.S. waters, CRISTAL had disbanded, and the U.S. had not adhered to CLC and FUND, a very substantial cost would be borne by the U.S. spill victims. There is no international compensation-contribution balance in this case, since neither CRISTAL nor FUND would be involved. However, as computed in Exhibit Part I-11, the U.S. would suffer $348 million in potentially uncompensated damages, or $31.6 million per year. This cost is far higher than the net contribution-compensation cost involved in any of the CLC/FUND alternatives considered.

Finally, Exhibit Part I-11 also shows that a single catastrophic spill ($100 million) in U.S. waters over an 11-year period would be sufficient for the U.S. to receive more from FUND than it contributes over the period. The U.S. would receive $30 million more from FUND than it pays. Combined with the assumed continuing U.S. payments to CRISTAL, however, this alternative shows a total net monetary cost of essentially zero.

This analysis indicates that one or two catastrophic spills in U.S. waters over a decade could change the U.S. monetary position in FUND from a net cost to a net benefit. The net monetary outcome also depends upon spill experience in other FUND nations. It is noteworthy that the net monetary balance for the United States of joining CLC and FUND is so close that one or two catastrophic spills could reverse the net balance. This highlights the value of FUND as insurance against unanticipated major spills.

b. Sensitivity to Incident Cost Increases

The effect of increased claims costs (by 50 percent) is illustrated in Exhibit Part I-11. Liabilities increase in dollar terms for shipowners, FUND and CRISTAL and in the uncompensated categories, with major increases in CRISTAL and FUND liabilities. In terms of cost allocation for spills in U.S. and other FUND-nation waters, the higher costs would reduce the shipowners' share of the total from 25 percent (base case) to 20 percent, while cargo interests' share would change slightly to 44 percent. Most significantly, uncompensated claims would increase from 30 to 36 percent of total cost. Overall, the net cost to the

U.S. would decrease from the basic CLC/FUND case, declining from $3.1 million to $2.1 million net cost per year. This would occur since a greater proportion of U.S. spill costs would be compensated under FUND.

The significance of this sensitivity analysis is that, as spill costs rise, a greater share is uncompensated unless limits are also increased. The monetary analysis conducted in this study has compared costs, in 1982 dollars, to present limits (as of end-1982). Limits must rise at the same rate as cost inflation in order to maintain the same allocation of spill costs among all parties. Some system of periodic adjustment of CLC and FUND limits is therefore desirable.

c. Sensitivity to Exchange Rate Fluctuations

The effect of the U.S. dollar appreciating and depreciating by 25 percent against the SDR was tested. This is relevant because CLC and FUND are denominated in SDRs. Both U.S. contributions to the FUND and compensation limits under FUND for spills in U.S. waters would vary in dollar terms. If the U.S. dollar strengthens, it takes fewer dollars to make the U.S. contribution, assuming that claims costs outside the U.S. maintain parity with the SDR. On the other hand, FUND limits are lower in dollar terms (relevant to U.S. spills). The net outcome (Exhibit Part I-11) is that the cost to the U.S. is reduced to $0.7 million per year, versus the basic CLC/FUND case of $3.1 million. If the dollar depreciates by 25 percent relative to the SDR, the reverse situation arises, and net U.S. monetary cost increases to $5.1 million per year.

E. SUMMARY OF FINDINGS

The benefits of United States adherence to CLC and FUND appear to outweigh the costs, as measured by the seven objectives. In a monetary sense, there is likely to be a slight cost to the United States of participating in the international FUND spill compensation system. However, oil spill experience is difficult to forecast, and one or two catastrophic oil spills in U.S. waters in the course of a decade would change an anticipated net cost of belonging to FUND into a net benefit. In this sense, FUND is a mutual insurance system among the member countries. The benefits provided by FUND's financial coverage of oil spills, combined with speedier settlement and greater predictability under the CLC and FUND provisions, would substantially advance

U.S. goals in the oil spill liability and compensation area. These conventions provide the additional benefit of harmonizing tanker oil spill legislation on a broad international basis. Adherence by the U.S. to the CLC and FUND conventions would also result in goodwill toward the U.S. from other nations and the international shipping and oil industries.

This summary briefly reviews the analysis of alternatives against the selected objectives.

- Net Monetary Cost--Assuming that future worldwide tanker oil spill experience is similar to that recorded during the 1970 to 1980 period, the net monetary cost of U.S. adherence to CLC and FUND is likely to be about $3 million per year (in 1982 dollars). This assumes present CLC and FUND limits, and continuation of CRISTAL. Once CRISTAL disbands, net costs to the U.S. will drop sharply. As other world nations join CLC and FUND, the net U.S. cost would return to the $3 to $4 million annual range. The highest limits for FUND presently under consideration would raise net U.S. costs to $8 million per year. On the other hand, one or two catastrophic spills occurring in the U.S. over an 11-year period, in addition to the 1970-1980 experience, would translate the net annual monetary cost of U.S. membership into a net annual benefit.

- Adequacy of Coverage--Adoption of CLC and FUND would greatly improve the coverage of tanker oil spills as compared to the present situation in the United States. Third-party damages for tanker oil spills would be specifically covered by shipowner liability and the IOPC Fund, as opposed to voluntary and temporary coverage provided by TOVALOP and CRISTAL or other coverage restricted by the Limitation of Liability Act. Cleanup costs would be covered more fully than under the FWPCA for the types of incidents included. The present FUND limits are not sufficient for a catastrophic spill, but are three times as high as the costliest U.S. spill to date. Upward revision of CLC and FUND limits to levels desired by the United States, is more likely at the 1984 diplomatic conference, if the United States participates as a member of CLC and FUND.

- Speed and Certainty of Payment--The elapsed time required to recover costs and damages and the certainty of recovery would be improved with U.S. adoption of the two conventions. Average time from incident to claim settlement is approximately 21 months less under FUND

than under CRISTAL. Certainty of recovery is improved, because the spiller is required to establish a limitation fund under CLC. Straightforward claims procedures are available under FUND which help claimants to avoid costly litigation.

- Predictability and Consistency--CLC and FUND adoption by the United States would provide an internationally agreed liability regime for oil tanker owners and a reasonably predictable level of costs for oil receivers. U.S. adherence would largely eliminate the need for the continued existence of CRISTAL, thus simplifying the existing structure of international oil compensation agreements. Consistent worldwide liability and compensation standards under CLC and FUND would reduce the incentive for claimants to pursue "forum shopping" to maximize their cost recovery.

- International Influence--U.S. ratification of the two conventions would give the U.S. strong influence in international forums concerned with oil spill liability and compensation, and other international maritime legal matters. Adherence to both conventions prior to the 1984 diplomatic conference would provide the U.S. with a major role in the CLC/FUND revision process. Such an action would support Japan and Western European nations' commitment to FUND, and earn international goodwill for the United States while also meeting key U.S. objectives. On the other hand, adoption of a "wait-and-see" attitude by the U.S., or ratification of CLC alone, could well have negative consequences on the revision process and for the perception of U.S. standing among the other major maritime powers.

- Domestic Regulatory Simplification--For laden, seagoing tank vessels carrying persistent oil, adherence to CLC and FUND would simplify the U.S. legal situation. CLC and FUND would greatly clarify the liabilities created and the compensation available to victims in the case of a tanker oil spill. They would replace a patchwork of federal and state laws and judicial interpretation for these spill types. For types of spill cases, not covered by the conventions, adherence would not remove inconsistencies or resolve the federal-state preemption issue.

- Fairness of Cost Allocation--In allocating the first layer of liability to shipowners under CLC and providing a substantial supplementary fund paid for by a levy

on oil receipts under FUND, the two conventions rationally allocate spill costs. This cost allocation is broadly in accordance with the most recent federal legislation in the three activity-specific areas (DWPA, TAPA, and OCSLAA). Additional cost burdens initially borne by tanker owners and oil receivers would amount to negligible percentages of their operating costs. These cost burdens would ultimately be passed through to oil consumers, thus respecting the economically efficient user fee doctrine. Yet the effect on oil consumers would scarcely be measurable. Taxpayers, who currently pay for part of the cost of oil spills under FWPCA, would be relieved of that portion of the burden due to tanker oil spills.

It is not possible to translate the nonmonetary benefits into terms directly comparable with the likely monetary cost of adhering to CLC and FUND. However, the importance of the nonmonetary objectives and the fact that they would be substantially advanced by U.S. adherence to CLC and FUND, suggests that the likely monetary costs are a small price to pay for a great improvement in oil spill liability and compensation legislation. The achievement of coverage fully adequate to protect against a catastrophic spill--the main shortcoming of CLC and FUND at present--is quite likely if the U.S. promptly ratifies the conventions and supports higher revised limits during the 1984 diplomatic conference. On balance, U.S. adoption of CLC and FUND is highly beneficial to the nation as a whole, and its distribution of costs and benefits is equitable and efficient. Remaining areas of improvement in the CLC and FUND conventions can best be remedied by U.S. adherence and active participation in policy setting for the regimes.

Exhibit Part I-1

APPROACH TO BENEFIT-COST ANALYSIS

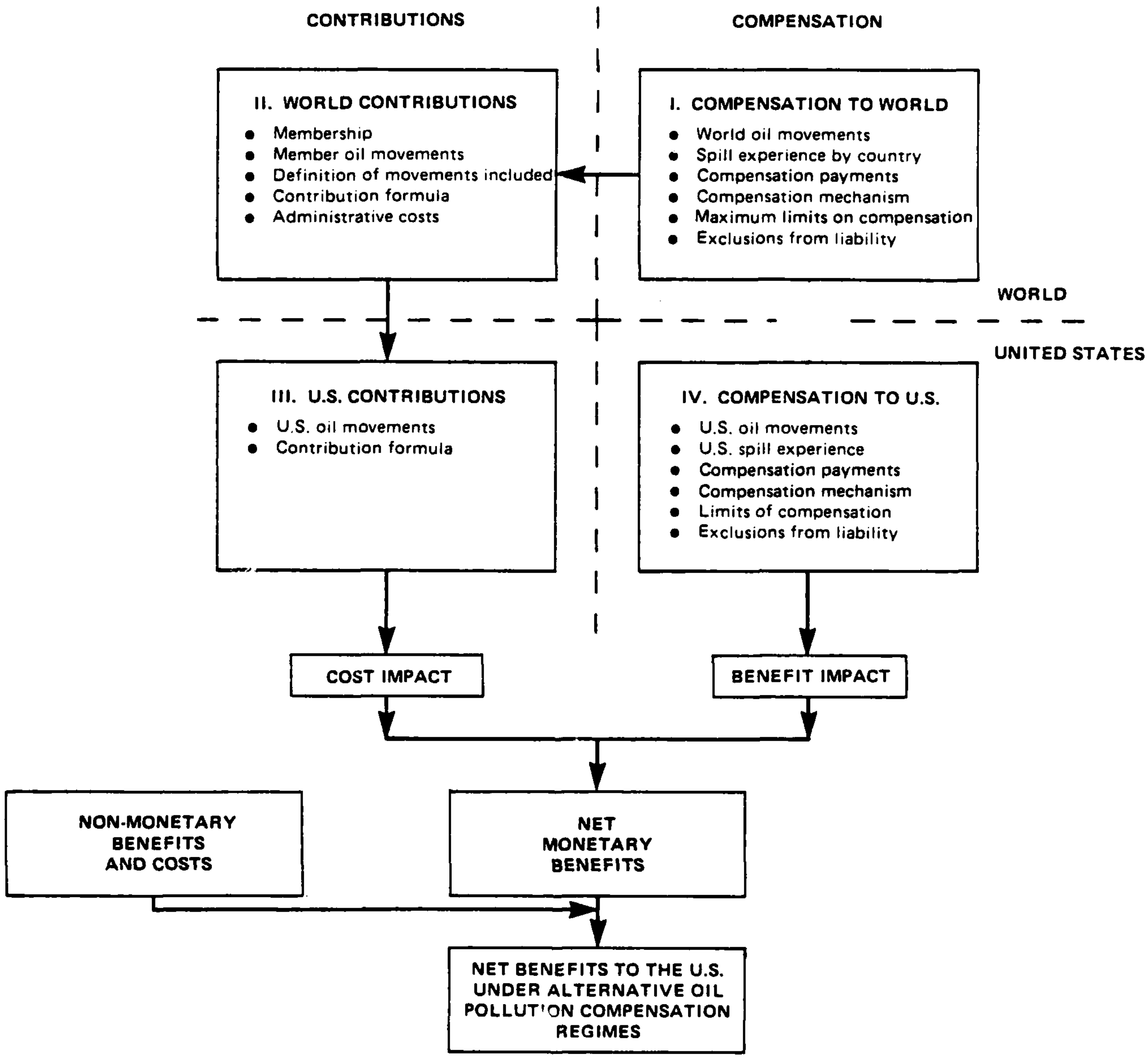


Exhibit Part I-2

GRAPH OF CLC/FUND AND
TOVALOP/CRISTAL REGIMES
(Values as of December 31, 1982)

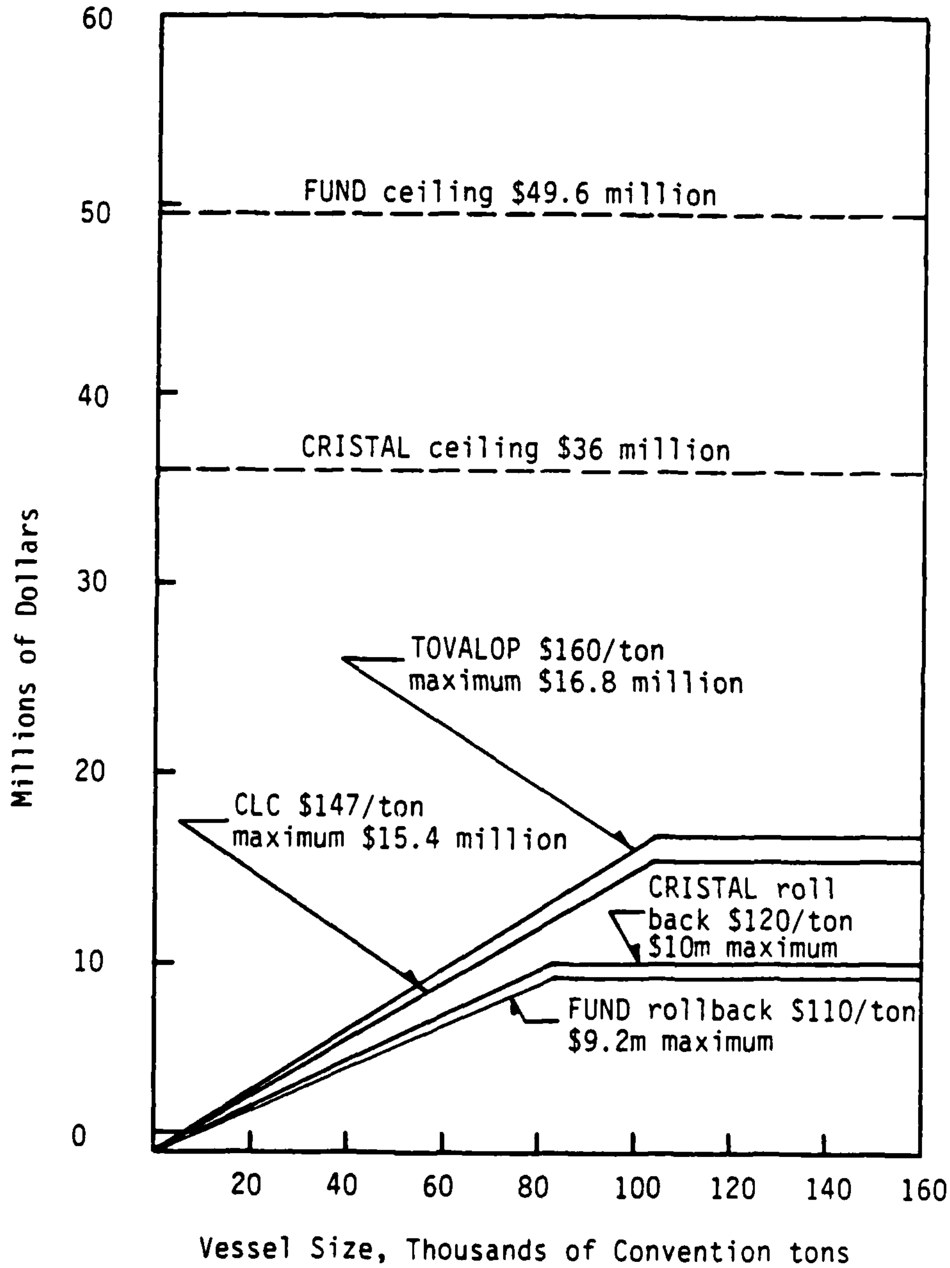


Exhibit Part I-3

MONETARY BENEFITS AND COSTS TO THE U.S. OF BASIC ALTERNATIVES
Projected Experience based on 1970-1980 data

(millions of 1982 dollars)

	U.S. Does Not Ratify CLC/FUND		U.S. Ratifies CLC and FUND		Whole World Ratifies CLC/ FUND	U.S. Ratifies CLC Only CRISTAL in effect
	CRISTAL in effect	CRISTAL not in effect	CRISTAL in effect	CRISTAL not in effect		
U.S. Compensation						
Shipowner Liability	60.1 TOV	60.1 TOV	54.7 CLC	54.7 CLC	54.7 CLC	57.4 CLC
Cargo Compensation	62.7 CR	0.0	68.1 FUND	68.1 FUND	68.1 FUND	65.4 CR
Uncompensated	0.0	62.7	0.0	0.0	0.0	0.0
Total	122.8	122.8	122.8	122.8	122.8	122.8
FUND Members (non-U.S.)						
Shipowner Liability (CLC)	77.4	77.4	77.4	77.4	77.4	77.4
Cargo Compensation (FUND)	163.2	163.2	163.2	163.2	163.2	163.2
Uncompensated	152.8	152.8	152.8	153.8	152.8	152.8
Total	393.4	393.4	393.4	393.4	393.4	393.4
Non-FUND Members						
Shipowner Liability	79.1 TOV	79.1 TOV	79.1 TOV	79.1 TOV	73.7 CLC	79.1 TOV
Cargo Compensation	113.4 CR	0.0	113.4 CR	0.0	129.7 FUND	113.4 CR
Uncompensated	10.9	124.3	10.9	124.3	0.0	10.9
Total	203.4	203.4	203.4	203.4	203.4	203.4
FUND Balance for U.S.						
Total FUND Compensation	163.2	163.2	231.3	231.3	361.0	163.2
U.S. Compensation	0.0	0.0	68.1	68.1	68.1	0.0
U.S. Contribution	0.0	0.0	70.0	70.0	104.0	0.0
CRISTAL Balance for U.S.						
Total CRISTAL Compensation	176.1	0.0	113.4	0.0	0.0	178.8
U.S. Compensation	62.7	0.0	0.0	0.0	0.0	65.4
U.S. Contribution	50.0	0.0	32.2	0.0	0.0	50.8
Total U.S. Benefit/Cost						
Benefit/Cost Projected for 11 Years	12.7 B	0.0	34.1 C	1.9 C	35.9 C	14.6 B
Annual Benefit/Cost	1.2 B	0.0	3.1 C	0.2 C	3.3 C	1.3 B
Gross Annual Contribution						
dollars per barrel						
U.S. Oil Owners (CR)	0.0015	0.0	0.0009	0.0	0.0	0.0015
U.S. Oil Receivers (FUND)	0.0	0.0	0.0021	0.0020	0.0030	0.0

Notes: (1) TOV, CR, CLC, FUND: Liability or compensation paid under TOVALOP, CRISTAL, CLC, or FUND.
(2) B, C: Benefit, Cost.
(3) U.S. contribution to FUND includes initial contribution (amortized over 11 years) and projected annual contributions.

Exhibit Part I-4

CALCULATION OF U.S. CONTRIBUTION SHARE TO CRISTAL AND FUND

(millions of metric tons)

A. CRISTAL SHARE

	U.S. CRISTAL/FUND Oil	Total CRISTAL Callable Oil	U.S. as % of Total CRISTAL
1970	280	1,211	23.1%
1971	298	1,300	22.9
1972	316	1,300	24.3
1973	376	1,471	25.2
1974	379	1,500	25.3
1975	390	1,386	28.1
1976	474	1,529	31.0
1977	544	1,714	31.7
1978	570	1,729	33.0
1979	564	1,757	32.1
1980	510	1,643	31.0
1981	444	1,414	31.4
Activity Summary 1970-1980	4,695	16,540	28.4%

Source: CRISTAL.

B. FUND SHARE

1. If U.S. joined FUND with present membership, U.S. share would be 29.6 percent:
   —Based on 1981 contributing oil, U.S. would be 444 out of (444 + 915) million metric tons, or 32.7 percent.
   —For the same year, U.S. was 31.4 percent of CRISTAL-callable oil.
   —Over the 1970-1980 period, U.S. was 28.4 percent of CRISTAL oil.
   —U.S. share of FUND is therefore 28.4% x 32.7/31.4=29.6%.

2. If U.S. joined FUND and all the world joined as well, the share would be 28.4 percent, taking CRISTAL-callable oil as a close proxy for world contributing oil.

Exhibit Part I-5

CALCULATION OF
INITIAL U.S. CONTRIBUTION TO FUND

Based on 1981 Contributing Oil of
444 Million Metric Tons

As of December 31, 1982

FUND Contribution rate .04718 gold francs per metric ton ÷ 15 gold francs per SDR
= .0031453 SDR per metric ton

and

one SDR = $1.103107
So the initial contribution rate is
= $.0034696 per metric ton

and

444,000,000 metric tons
times $.0034696
= $1,540,503 initial U.S. contribution

Exhibit Part I-6

CLC/FUND CONVENTION RATIFICATION PROPORTION
OF WORLD'S OIL TANKER FLEET

(June 1981)

	Member		Non-member		
	CLC Only	CLC and FUND	U.S.	Other Nations	Total
	thousands of deadweight				
Nations with Fleets Over 5 million deadweight	49,285	197,626	15,932	5,004[1]	267,847
Nations with Fleets Under 5 million deadweight	7,906	19,960	—	17,874[2]	45,740
Total	57,111	217,586	15,932	22,878	313,587
	percent of fleet				
Nations with Fleets Over 5 million deadweight	16%	63%	5%	2%	86%
Nations with Fleets Under 5 million deadweight	2	6	—	6	14
Total	18%	69%	5%	8%	100%

[1]Singapore (5,004).
[2]Major Nations Include South Korea (2,501); Iraq (2,132); India (2,067); Libya (1,383), Argentina (1,212); Phillipines (1,143), Iran (1,175); Poland (994); Mexico (827); Turkey (743); and Romania (608). All other nations total (3,089).

Source: TBS Analysis of Lloyds Register of Shipping Statistical Tables.

Exhibit Part I-7

REVISED CLC AND FUND LIMIT CASES

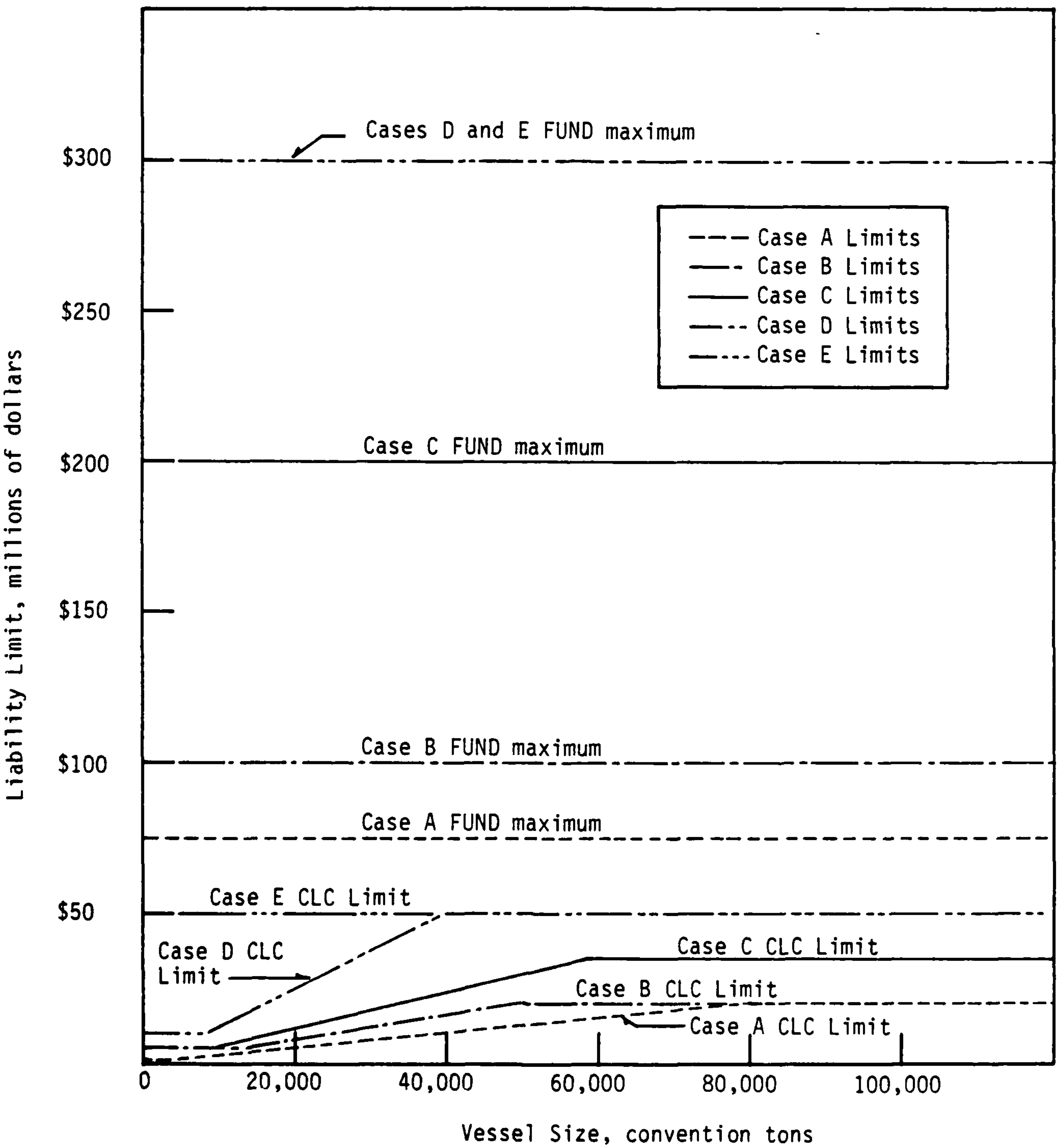


Exhibit Part I-8

MONETARY COSTS AND BENEFITS OF REVISED CLC AND FUND LIMITS
PROJECTED EXPERIENCE BASED ON 1979-1980 DATA

Millions of 1982 Dollars

Case	CLC and FUND Current Limits	A	B	C	D	E
Shipowner Minimum (CLC)	0	$ 1	$ 5	$ 5	$ 10	$ 50
Shipowner Maximum (CLC)	15.4/9.2	20	20	35	50	50
FUND Maximum	49.6	75	100	200	300	300
CLC Rate Per Convention Ton	174/110	250	400	600	1,250	Flat Tranche
Ship Size at CLC Maximum, Gross Tons	83,636	80,000	50,000	58,300	40,000	None
U.S. (FUND member)						
Shipowner Compensation (CLC)	54.7	83.5	95.3	98.8	116.0	122.8
FUND Compensation	68.1	39.3	27.5	24.0	6.8	0.0
Uncompensated	0.0	0.0	0.0	0.0	0.0	0.0
Total U.S.	122.8	122.8	122.8	122.8	122.8	122.8
FUND Members (non-U.S.)						
Shipowner Compensation (CLC)	77.4	124.1	137.7	162.2	193.7	241.4
FUND Compensation	163.2	164.4	175.7	231.2	199.7	152.0
Uncompensated	152.8	105.0	80.0	0.0	0.0	0.0
Total	393.4	393.4	393.4	393.4	393.4	393.4
Non-FUND Members						
Shipowner Compensation (TOVALOP)	79.1	79.1	79.1	79.1	79.1	79.1
CRISTAL Compensation	113.4	113.4	113.4	113.4	113.4	113.4
Uncompensated	10.9	0.0	10.9	10.9	10.9	10.9
Total	203.4	203.4	203.4	203.4	203.4	203.4
Total FUND Compensation						
Total U.S	68.1	$39.3	$27.5	$24.0	$6.8	$0.0
Total FUND Compensation	231.3	$203.7	$203.2	$255.2	$206.5	$152.0
U.S. Share of Compensation	29.6	19.3%	13.5%	9.4%	3.3%	0.0%
U.S. Share of Contribution	68.1	29.6%	29.6%	29.6%	29.6%	29.6%
U.S. Contribution (Cost)		$60.3	$60.1	$75.5	$61.1	$45.0
U.S. Initial Payment	1.5	1.5	1.5	1.5	1.5	1.5
Total U.S. FUND Contribution	70.0	61.8	61.6	77.0	62.6	46.5
U.S. Contribution to CRISTAL	32.2	32.2	32.2	32.2	32.2	32.2
Total Cost	$102.2	$94.0	$93.8	$109.2	$94.8	$78.7
Net Cost	$ 34.1	$54.7	$66.3	$85.2	$88.0	$78.7
Net Cost Per Year	$ 3.1	$5.0	$6.0	$7.7	$8.0	$7.2
Allocation of Costs for All Spills in FUND Members' Waters						
Shipowner	25	40	45	51	60	71
Oil receiver	45	40	39	49	40	29
Uncompensated	30	20	16	0	0	0

[1]Assumptions:

1. *FUND would include present members plus the U.S.*
2. Analysis does not address CRISTAL (i.e., over 1970-1980 period CRISTAL ends).
3. Based on analysis of 148-spill database.

Exhibit Part I-9

ALLOCATION OF COSTS UNDER REVISED
CLC AND FUND LIMITS

Case	Present Situation	A	B	C	D	E
Shipowner Min. (CLC) ($MM)	0	1	5	5	10	50
Shipowner Max. (CLC) ($MM)	15.4	20	20	35	50	50
FUND Maximum ($MM)	49.6	75	100	200	300	300
A. World Shipowners' costs						
DWT/GRT Ship Size	Base P&I Premium	Additional Cost on per-GRT Basis				
7,500/4,500	$ 32,500	$ 207	$ 275	$ 251	$ 482	$ 626
37,500/21,764	72,000	1,001	1,328	1,698	2,329	3,025
60,000/32,000	81,000	1,472	1,950	2,496	3,424	4,448
120,000/61,500	94,400	2,829	3,750	4,797	6,581	8,549
265,000/132,500	124,000	6,095	8,083	10,335	14,178	18,418
		Additional Cost on per-Ship Basis				
All sizes		$990	$1,322	$2,190	$2,329	$3,044
B. U.S. Oil Cargo Owners' Costs (CRISTAL continuing)						
Annual Contrib. ($MM)	4.5	2.9	2.9	2.9	2.9	2.9
as $/barrel	.0015	.0009	.0009	.0009	.0009	.0009
C. U.S. Oil Receivers' Costs (under FUND)						
Annual Contrib. ($MM)	0.0	5.6	5.6	7.0	5.7	4.2
as $/barrel	-	.0018	.0018	.0023	.0018	.0014

Exhibit Part I-10

SENSITIVITY TO DIFFERENT SPILL DISTRIBUTIONS
DEFINITION OF CATASTROPHIC SPILLS

(millions of 1982 dollars)

Catastrophic Spills	Spill A	Spill B	Two Spills Combined
Tanker Deadweight	90,000	265,000	-
Gross Tonnage	47,400	132,500	-
Convention Tonnage	42,600	119,250	-
Registered	FUND Country	FUND Country	-
Incident Cost	$100.0	$200.0	-
Shipowner Liability (CLC)	4.7	9.2	$ 13.9
FUND Liability	44.9	40.4	85.3
Uncompensated	50.4	150.4	200.8
	100.0	200.0	300.0

Cases tested include Spill A, and Spill A with Spill B in U.S. waters, plus 1970-1980 experience; and Spill A and Spill B in other FUND country waters, plus 1970-1980 experience.

Exhibit Part I-11

MONETARY BENEFITS AND COSTS OF ALTERNATIVE SPILL DISTRIBUTIONS
AND ECONOMIC VARIABLES

Projected Experience based on 1970-1980 data
Assumes U.S. in CLC and FUND, CRISTAL Continues

(millions of 1982 dollars)

	Different Spill Distributions (see Exhibit Part I-10)						
	One Catastrophic Spill in U.S. (Spill A)	2 catastrophic spills in: U.S.	2 catastrophic spills in: Other FUND Countries	U.S. not in CLC, FUND or CRISTAL: 2 U.S. Spills	50% Higher Claims	Dollar Increases Value by 25% versus SDR	Dollar Decreases Value by 25% versus SDR
U.S. Compensation							
Shipowner Liability	59.4 CLC	68.6 CLC	54.7 CLC	75.2 TOV	64.1 CLC	46.0 CLC	61.2 CLC
Cargo Compensation	113.0 FUND	153.4 FUND	68.1 FUND	0.0	120.1 FUND	76.8 FUND	61.6 FUND
Uncompensated	50.4	200.8	0.0	347.6	0.0	0.0	0.0
Total	222.8	422.8	122.8	422.8	184.2	122.8	122.8
FUND Members (non-U.S.)							
Shipowner Liability (CLC)	77.4	77.4	91.3	77.4	94.0	58.1	96.8
Cargo Compensation (FUND)	163.2	163.2	248.5	163.2	217.3	122.4	204.0
Uncompensated	152.8	152.8	353.6	152.8	278.8	114.6	191.0
Total	393.4	393.4	693.4	393.4	590.1	295.1	49.8
Non-FUND Members							
Shipowner Liability	79.1 TOV	79.1 TOV	79.1 TOV	79.1 TOV	98.2 TOV	66.6 TOV	89.6 TOV
Cargo Compensation	113.4 CR	113.4 CR	113.4	0.0	145.5 CR	85.9 CR	131.5 CR
Uncompensated	10.9	10.9	10.9	124.3	61.3	10.9	33.1
Total	203.4	203.4	203.4	203.4	305.0	163.4	254.2
FUND Balance for U.S.							
Total FUND Compensation	276.2	316.6	316.6	163.2	337.4	199.2	265.6
U.S. Compensation	113.0	153.4	68.1	0.0	120.1	76.8	61.6
U.S. Contribution	83.3	95.2	95.2	0.0	101.4	60.5	80.1
CRISTAL Balance for U.S.							
Total CRISTAL Compensation	113.4	113.4	113.4	0.0	145.5	85.9	131.5
U.S. Compensation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
U.S. Contribution	32.2	32.2	32.2	0.0	41.3	24.4	37.3
Total U.S. Benefit/Cost							
Benefit/Cost Projected for 11 Years	2.5 C	26.0 B	59.3 C	0.0	22.6 C	8.1 C	55.8 C
Annual Benefit/Cost	0.2 C	2.4 B	5.4 C	0.0	2.1 C	0.7 C	5.1 C

Notes: (1) TOV, CR, CLC, FUND: Liability or compensation paid under TOVALOP, CRISTAL, CLC, or FUND.
(2) B, C: Benefit, Cost.
(3) U.S. contribution to FUND includes initial contribution (amortized over 11 years) and projected annual contributions.
(4) U.S. ratifies CLC and FUND, CRISTAL in effect, except for third column.

PART II

TECHNICAL ANALYSIS

I. DESCRIPTION OF OIL POLLUTION LIABILITY AND COMPENSATION REGIMES

A. OVERVIEW OF REGIMES

Compensation limits for pollution damage and cleanup costs incurred following spills by tankers are determined under both national and international legal systems. In the United States, federal law and statutes in certain states specifically address oil pollution liability. Other nations rely on general maritime law to establish liability and liability limits. An international legal regime dealing with oil pollution liability has also been created, based on two conventions of the United Nations' International Maritime Organization (IMO).

The considerable costs of cleaning up oil spills and compensating third parties for damages has given rise to insurance, which covers the shipowner's liability, and to special funds, which cover certain additional costs above the limit of shipowner's liability. The IMO system requires that vessel owners have certain levels of insurance and establishes an international fund for complementary compensation financed by levies on oil moved by sea. The international shipping and oil industries have developed parallel voluntary agreements, requiring tanker insurance for oil pollution cleanup and damages and providing additional compensation when owners' limits are exceeded. A very high percentage of the world's tankers and oil cargoes are covered by the voluntary agreements. Both IMO conventions have been adopted by most of the major shipowning and oil importing nations. However, the United States has not adopted either one. The shipowners' insurance cover is complemented in the United States by resources from special federal and state funds, and by the oil companies' voluntary compensation agreement.

The international public and private regimes are described below:

- IMO Conventions:

  --The 1969 Convention on Civil Liability for Oil Pollution Damage (CLC) governs the shipowner's liability for oil pollution damage in nations that have ratified the convention.

--The 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND) provides additional compensation in member states.

- Voluntary Industry Agreements

--The Tanker Owners' Voluntary Agreement Concerning Liability for Oil Pollution Damage (TOVALOP) was established in 1969 as the shipowning industry's equivalent to CLC.

--The Contract Regarding Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL) was created in 1971 as the oil industry's equivalent to the FUND.

The relationship of the four instruments can be illustrated as follows:

	Shipowner's Liability	Additional Compensation
International Conventions	CLC	FUND
Voluntary Industry Regimes	TOVALOP	CRISTAL

The purpose of the CLC and FUND Conventions is to establish liability for damages resulting from a discharge of oil from a seagoing tanker or tank barge, and to ensure the payment of cleanup costs and damages. The voluntary industry agreements are similar to the public conventions and were established to serve the same needs. The industry agreements came into effect very quickly and have had wide application. The international conventions now cover many of the world's coastal states--51 nations for CLC and 27 for FUND--though the ratification process has been fairly lengthy.

The impetus behind both the international conventions and the voluntary industry agreements is generally traced to the TORREY CANYON incident in 1967. This tanker ran aground in the English Channel, spilling its cargo of crude oil and causing extensive pollution of the English and French coasts. The scale of the spill and its cleanup led both governments and oil companies to consider the need for better measures to minimize tanker accidents and to establish clear financial responsibility for the effects of a spill. Difficulties encountered in obtaining compensation after the spill highlighted existing legal inadequacies. In order to sue a vessel owner, a government had first

to establish which court of law had jurisdiction over the shipowner. It was also necessary to prove that the owner, captain, or crew of the ship was at fault. These questions delayed any settlement. Speed of settlement and administrative ease were thus major concerns in establishing the conventions and the voluntary industry liability and compensation regimes.

Within the United States, important legislative action was taken during the 1970s aimed at oil pollution liability and compensation. Previously, the Limitation of Liability Act of 1851 restricted maritime liability to the value of the vessel and pending freight after a casualty. In 1972, the Federal Water Pollution Control Act (FWPCA) was amended to provide an effective basis for establishing liability and compensation for oil spill damages. These amendments included the provisions of the 1970 Water Quality Improvement Act. As subsequently amended by the Clean Water Act of 1977, the FWPCA declared a national policy of eliminating the discharge of pollutants in U.S. waters by 1985. The FWPCA makes the spiller strictly liable to the federal government for cleanup costs, up to certain limits, and it also authorizes a revolving fund.

Federal legislation was also passed dealing with liability and compensation under special pollution circumstances:

- The Trans-Alaska Pipeline Authorization Act of 1973 (TAPA) established liability and compensation limits, together with a compensation fund, for oil spills related to the Alaskan pipeline and for vessels carrying oil that had been transported through the pipeline.

- The Deepwater Port Act of 1974 (DWPA), set liability limits and created a fund to pay for oil pollution damages caused by operations of special deepwater oil terminals and for vessels discharging oil within the deepwater port safety zone or from a vessel having received oil at a deepwater port.

- The Outer Continental Shelf Lands Act Amendments of 1978 (OCSLAA), established liability limits and a pollution fund for spills emanating from offshore oil drilling or vessels carrying oil produced on the outer continental shelf.

State legislation in the United States complicates the liability question further. In 1973, a landmark U.S. Supreme Court decision (Askew v. American Waterways) held that federal legislation did not preempt a state from enacting its own pollution

liability regime. Several coastal states developed liability limits and compensation funds in the 1970s. Notable examples are Maine, Florida, and Alaska.

B. DESCRIPTION OF INTERNATIONAL REGIMES

The international conventions and voluntary industry agreements take somewhat different approaches to the broad questions of oil pollution liability and compensation. The major international regimes are described in this section in the following order:

- CLC and TOVALOP
- FUND and CRISTAL

1. CLC and TOVALOP

CLC is an internationally legislated regime that establishes shipowner liability for tanker-source oil pollution damage. TOVALOP is a voluntary agreement to establish liability for the same sort of damage. These regimes fix the parameters for protection and indemnity (P&I) insurance or other evidence of financial responsibility required to be maintained by tanker owners. A summary of their major characteristics is presented in Exhibit I-1.

History. Both the CLC and TOVALOP date from 1969. The TORREY CANYON disaster provided a key impetus to both agreements, which adopted the principle of strict liability (without regard to fault) of tanker owners for oil spills. Both sought to provide a clear mechanism to compensate parties for cleanup costs and damages. CLC was negotiated at an IMO (then IMCO) conference in Brussels between representatives of 46 countries, including the United States. It came into force on June 19, 1975. TOVALOP was originally sponsored by seven major groups of tanker-owning oil companies. It was agreed shortly before the CLC Conference, and was partly intended to serve as a model for the inter-governmental convention. TOVALOP came into operation in October 1969.

Status and Membership. CLC has the status of international legislation; when it is ratified by a country, it legally establishes shipowner liability standards for an oil spill affecting that country. By January 1979, CLC had been ratified by 37 countries, including the U.S.S.R., Brazil, Indonesia, South Africa,

Japan, and much of Europe. In May 1983, 51 countries were members (see list in Exhibit I-2). TOVALOP is a voluntary agreement among shipowners that now covers about 97 percent of the world's tanker tonnage. Its membership presently consists of 3,200 companies that operate 6,567 tankers with a total gross tonnage of 182 million gross register tons (GRT).

The oil companies have been largely responsible for TOVALOP's near-total acceptance by tanker owners, since their charter parties require that the vessel be entered under TOVALOP. While TOVALOP members agree to carry insurance up to certain limits, the agreement does not constitute a legally enforceable regime.

Coverage. CLC provides geographical coverage, while TOVALOP covers vessels. CLC applies to seagoing vessels carrying persistent oil in bulk as cargo at the time of an incident. This is the reason the CLC is known or referred to as tanker legislation. This definition excludes tankers on ballast voyages. Oil is defined as persistent oil; spills of nonpersistent oil are not covered. Cleanup costs and damages are covered, although only those preventive measures taken after an actual spill has occurred are included. The CLC provisions apply to any spill causing damage to the territory (including the territorial sea) of a contracting state, regardless of the nationality of the shipowner, the flag of the vessel, or the nationality of the claimant.

TOVALOP applies to all seagoing tankers owned by contracting shipowners or bareboat charterers, whether laden or in ballast. However, there is no liability for pollution damage under TOVALOP in any incident that involves a CLC-member state; this is intended to avoid double liability under CLC and TOVALOP. In a spill involving both CLC and non-CLC countries, the owner may be liable under CLC terms in one state and liable under other national law in the non-CLC state. As opposed to CLC, TOVALOP covers pre-spill preventive measures. TOVALOP's definition of oil (persistent hydrocarbon mineral oil, such as crude oil, fuel oil, heavy diesel oil, and lubricating oil) is practically the same as that used under CLC (persistent oil including whole oil).

Financing Arrangements. The costs of carrying insurance are borne directly by the shipowners or bareboat charterers under CLC and TOVALOP.

Compensation Mechanisms. Compensation under CLC or TOVALOP constitutes the first layer of financial resources to be used in combatting an oil spill. Cleanup costs and third-party damage

claims are paid by the shipowner or his P&I Club. These mechanisms are administered as part of an owner's normal P&I insurance coverage.

Liability. Under CLC, the owner alone is liable, and other persons such as the master and the crew or agents are not liable. However, the liability of other parties is not clear, since the convention does not deal with parties such as bareboat charterers or salvors; channeling of liability to these parties is left open and subject to national law, and is an important issue at present. The owner is strictly liable, regardless of whether the incident occurred as a result of the owner's or the crew's fault. Defenses are available in the case of war, natural phenomena of an exceptional, inevitable and irresistible character, acts or omissions done with intent to cause damage by a third party, and negligence by the authorities in maintaining navigational aids. The owner may also be wholly or partially exonerated from his liability if the pollution damage resulted from intentional acts or negligence by the claimant. These exceptions have not often arisen in practice.

The basis of liability under TOVALOP is strict, as under CLC. The owner's defenses are identical to those available under CLC, as noted above. However, TOVALOP applies to both owners and bareboat charterers, while CLC only covers owners.

Limits of Liability. CLC sets limits of liability for the shipowner in terms of Poincare gold francs, which can also be expressed in Special Drawing Rights (SDRs--the international reserve currency unit created by the International Monetary Fund) on the basis of one SDR per 15 gold francs. The U.S.-dollar value of the CLC limit fluctuates constantly, since the SDR is composed of a "basket" of currencies. The owner's limit of 2,000 gold francs (SDRs 133.3) per ton up to a maximum of 210 million gold francs (SDRs 14 million) is equivalent to $147 per ton and $15.4 million at end-1982 exchange rates. Tonnage is measured in terms of "convention tonnage" which is slightly less than gross register tonnage (GRT).

The owner's limit of liability under the voluntary TOVALOP agreement is fixed at $160 per convention ton with a maximum liability of $16.8 million per incident. These levels were set equal to CLC levels at past exchange rates; the strength of the dollar in recent years has caused a decline in the dollar value of CLC limits relative to the TOVALOP level.

Both CLC and TOVALOP define a shipowner's liability limit that begins at zero dollars for an imaginary zero-ton tanker, proceeds along an upward-sloping line at a fixed dollars-per-ton

angle (for a given US $/SDR exchange rate), and is flat above a certain tonnage point (Exhibit I-3). Thus, despite rather minor differences ($1.4 million in maximum limit at end-1982), the limits are conceptually identical and embody both a per-ton limit for smaller tankers and a fixed maximum limit for tankers above a certain size.

The 1969 Brussels conference set the CLC limits at double the amount per ton that had been established in the 1957 Limitation of Liability Convention. (The convention established a limit of 1,000 gold francs per ton for shipowners' liability in respect of Maritime claims involving loss of life, cargo, wreck removal, etc.; the U.S. was not a party to this convention). The limits were not set higher partly because it was felt that liability beyond this point was not insurable due to perceived capacity constraints in the insurance markets, and partly because of shipowners' concern over the increased financial burden involved.

<u>Grounds for Breaking the Liability Limits</u>. Under the CLC, the owner may limit his liability provided the incident did not occur as a result of the owner's actual fault or privity. For instance, the master's fault alone causing an incident would not break the owner's liability. However, the interpretation of "actual fault or privity" depends upon the national court having jurisdiction, and may vary somewhat from country to country. The legal interpretation of the grounds for breaking liability is a key issue, as we shall see in Chapter II.

The TOVALOP agreement, because it is a voluntary undertaking of shipowners, naturally contains no reference to the possibility of breaking the liability limit offered. In fact, the level is not a legal limit, but simply an agreement to pay costs up to that amount. Under the terms of the insurance contract between the owner and his P&I Club, only the willful misconduct of the owner would lead a P&I Club to refuse to pay compensation. Because TOVALOP is a voluntary agreement, this limit may not be accepted by claimants and, of course, does not constitute a legal limitation in any country, as CLC does in its member states. However, it becomes a firm limit for the owner if CRISTAL is involved in the incident due to the indemnification provisions of that agreement.

<u>Compulsory Insurance</u>. CLC provides that the shipowner must maintain insurance or other financial security to cover his liability for any vessel carrying more than 2,000 tons of oil in bulk as cargo. Member states are required to issue a certificate as evidence of the up-to-date maintenance of insurance coverage on vessels flying their flag. Member countries are also charged

with ensuring that no non-CLC-member vessels (carrying over 2,000 tons of cargo oil) enter their ports without the required coverage. This broadens the effective coverage of CLC.

Shipowners who are parties to TOVALOP are required to establish and maintain their financial capability sufficient to fulfill their obligations under the agreement. No minimum vessel tonnage is stated. Rather, the agreement is applicable to all of the shipowner's sea-going vessels that are designed to carry oil in bulk as cargo.

Administration. CLC is administered by a government agency within each member country, which is charged with providing certificates of financial responsibility. Governments are also required to check for evidence of financial responsibility (insurance) for oil pollution before admitting nonmember vessels to their ports.

TOVALOP is administered by the International Tanker Owners' Pollution Federation Limited, with a small staff based in London. The Federation provides a range of specialized services related to oil pollution problems, including technical advice to governments, spill victims, shipowners, and insurers during oil spills.

Claims Procedure. Under CLC, actions may be brought against the owner (or his insurer) only in the courts of member countries that suffered the pollution damage. Thus, if a spill affects only French waters, action must be brought in a French court. If the spill causes damage in several CLC-member nations, actions for compensation may be brought in the courts of any of the damaged states. An action must be brought within three years from the date when the damage occurred. In order to avail himself of the benefit of limitation, a shipowner must constitute a limitation fund equal to his liability limit with the court in a country in which an action is brought. The fund can be constituted by depositing the amount, or by producing a bank guarantee or other guarantee acceptable to the state involved. Once the fund has been established, the courts in that state have exclusive competence over the distribution of the fund. If the owner (or his P&I Club) incurs cleanup costs or pays damage claims before this fund is distributed, the shipowner acquires a corresponding claim against the fund. CLC clearly states that, once the owner has established his limitation fund and is entitled to limit his liability, no one can claim against any other assets of the owner, or challenge the exclusivity of the recourse against the fund. The court must order the release of the ship or any other property of the owner that has been arrested in respect of a pollution damage claim from the incident. Any judgment given

by the court of jurisdiction is recognized by all other CLC nations.

The TOVALOP agreement provides only that a written notice of claim must be received by the shipowner within one year of the date of the incident. Since TOVALOP is not a legal regime, it does not discuss the questions of jurisdiction or the constitution of a limitation fund. Disputes over claims are to be settled, as a last resort, by arbitration of the International Chamber of Commerce.

2. FUND and CRISTAL

The International Oil Pollution Compensation Fund (IOPC Fund, or simply FUND) and the Contract Regarding Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL) are compensation schemes that supplement the shipowner's liability and insurance under CLC and TOVALOP.[1] The two systems are paid for by contributions from the oil industry, but FUND has the status of an international treaty while CRISTAL is a voluntary--and interim--industry agreement. While the two schemes have many common features, they have differences that have been important in practice (see Exhibit I-4). This section describes the principal features of FUND and CRISTAL.

History. A resolution was taken at the 1969 CLC conference that IMCO should convene, by 1971, an international legal conference to consider and adopt a "supplementary scheme in the nature of an international fund . . . to ensure that adequate compensation will be available for victims of large-scale oil pollution incidents." In late 1971, a conference was held in Brussels and the FUND Convention was concluded. FUND entered into force on October 16, 1978, and undertook to cover liability for incidents that occurred beginning 120 days later (February 1979). In April 1979, the FUND Assembly increased the maximum amount payable for a single incident.

CRISTAL was created by the major oil companies in 1971, recognizing that the FUND Convention would take several years to come into force. CRISTAL became effective on April 1, 1971. It was revised on June 1, 1978, to bring it into closer agreement with FUND, in particular by including third-party damages in

[1]FUND is used in this report to refer to the regime specified by the convention; IOPC Fund is used to refer to the administrative and financial entity established.

addition to cleanup costs, by adding pure threat coverage, by including spills of bunker oil, and by raising the maximum limit per incident. However, the CRISTAL limit was not raised any further in response to the 1979 FUND increase, partly in order to preserve an incentive for nations to adhere to FUND and partly because there was no corresponding increase planned in the shipowner's limit of liability.

Statements contained in the preamble to the FUND Convention and in the resolution adopted at the CLC conference establish a clear set of objectives for FUND:

a. An additional or supplementary source of compensation, beyond that made available by shipowners under CLC, is needed in order to ensure adequate compensation for victims of oil pollution damage in all cases.

b. This fund should be financed by the oil cargo interests so that "the economic consequences of oil pollution damage . . . should not exclusively be borne by the shipping industry . . . ."

c. The fund should also "in principle relieve the shipowner of the additional financial burden imposed" by the CLC Convention.

The CRISTAL agreement also has as its major objective the provision of supplemental compensation, but this is on an interim basis until FUND is widely accepted. The purposes of CRISTAL are as follows:

a. To provide supplemental compensation beyond that available under CLC and TOVALOP.

b. To continue the agreement until FUND comes into force, and to consider continuing the contract until FUND is sufficiently widespread to provide comparable supplemental coverage throughout major areas of the world.

c. To create financial incentives to encourage shipowners (and others) to take prompt action in preventing or mitigating pollution damage.

Status. The FUND and CRISTAL agreements have the same relative legal status as CLC and TOVALOP: FUND and CLC are international treaties that have been adopted as part of the national legal structure of member countries, while CRISTAL and TOVALOP are purely voluntary agreements between private parties, whether

oil companies or shipowners. This distinction has been important in practice, as discussed in Chapter II.

Membership. The FUND Convention can only be ratified by nations that are parties to CLC. FUND has been ratified by 27 countries, as of May 1983 (see Exhibit I-5). The most recent country to join is Fiji, while bills are currently before the Canadian parliament regarding accession to FUND and CLC. The FUND membership includes most European coastal states and Japan. The U.S.S.R., a member of CLC, has not yet joined FUND.

CRISTAL is now composed of some 800 oil company members. These include all the major oil companies and their subsidiaries and many smaller ones, but the oil trading firms that are increasingly involved in international shipments are not generally parties to CRISTAL.

Coverage. The FUND Convention includes payments for spill cleanup and damages on the one hand, and a rollback (or indemnity) to shipowners on the other hand. There are distinct requirements for coverage of these two types of payment.

For spill cleanup cost and damage claims, FUND is effective if the damage occurred to the territory or the territorial sea of a contracting state. Spills covered are those involving persistent mineral oils whether carried as cargo or bunkers, provided the ship is actually carrying oil in bulk as cargo.

For indemnification of a shipowner, the vessel involved must be flying the flag of a FUND-contracting state.

CRISTAL covers spills that cause damage to the territory or territorial seas of any country. However, the tanker involved must be owned by (or bareboat chartered to) a party to TOVALOP, and the oil must be owned or deemed to be owned by a CRISTAL member. Also, as under FUND, the tanker must be laden (as opposed to the additional TOVALOP coverage of ballast tankers). CRISTAL also provides an indemnification to the shipowner. The definition of oil used is the same as that in the FUND Convention.

Financing Arrangements. The funding method is similar for both the IOPC Fund and CRISTAL. Both are financed by levies on oil companies for crude and fuel oil received that has been transported by sea. This arrangement was selected largely for administrative convenience when CRISTAL and the IOPC Fund were first established and the oil was owned by the same oil company from the well to the refinery. Today, when different parties may own the oil at various stages of its journey, the burden is placed more squarely on oil importers and those in the refined

products trade; oil exporters and coastal nations whose shoreline is passed by oil tankers are not assessed despite the threat of a spill and subsequent possibility of compensation under FUND or CRISTAL. (See Chapter V for a full discussion of U.S. and international oil movements.)

FUND levies contributions on the basis of the tonnage of "contributing oil" received, which is defined as crude oil and fuel oil (ASTM No. 4 and heavier grades). Contributions must be paid to the IOPC Fund by all companies in the contracting state who receive contributing oil carried by sea to the terminal, or who receive oil that was landed in a nonmember state and then transported (e.g., by pipeline) to the member state. FUND contributing oil includes crude oil that is received solely for transshipment by tanker. Any company or person in a member state who receives a total quantity of more than 150,000 metric tons per year of such oil, including receipts of subsidiaries and other commonly controlled entities, must contribute.

Contributions to the IOPC Fund are of two types--initial contributions and annual contributions. The initial contributions are paid when the convention entered into force (1978) or upon subsequent ratification by a state. This amounts to 0.04718 gold francs (SDRs 0.003145 or about $0.003469) per ton of contributing oil received during the calendar year preceding the date on which the convention is ratified by a particular state. Annual contributions are raised as required to meet the IOPC Fund's needs for claims payments and administration. The amount of the annual contributions depends largely on the claims experience of the IOPC Fund, and thus varies from year to year. The sum required is raised from companies in member states on the basis of contributing oil received during the preceding year, except that claims exceeding 15 million francs (SDRs 1 million or about $1.1 million) are only apportioned among parties in states that were members of FUND at the time of an incident.

While the responsibility for making contributions rests with the parties receiving the oil, governments can choose to make a payment to the IOPC Fund to cover amounts due from any or all oil receivers in their territory. Interest is charged on overdue contributions.

Contributions to CRISTAL are based on all crude and fuel oil receipts of the oil companies who are parties to the agreement (there is no minimum level, such as the 150,000 tons per year specified in FUND). The oil company can also elect to be considered the owner of an oil cargo, for the purpose of having the cargo covered by CRISTAL; this oil is also counted for contribution purposes. Unlike FUND, crude oil receipts are counted only

once, when the oil is received at the refinery, even if it is landed at a transshipment terminal and thereafter moved in smaller vessels to another country. Since company contributions are consolidated in some cases on a companywide basis rather than a national basis, it is not possible to compute the CRISTAL contributions by country. The initial call for CRISTAL was set at $5 million, apportioned on the basis of oil receipts. Periodic calls, similar to the IOPC Fund's annual contributions, are levied from time to time to replenish CRISTAL's fund.

Liability. The FUND Convention covers pollution damage not adequately compensated under CLC either because of

a. Lack of shipowner liability under CLC,

b. Financial incapacity of the vessel owner, or

c. Damages exceeding CLC limits.

Pollution damages and preventive measures are defined exactly as under CLC. This means that "pure threat" preventive measures (actions taken prior to a spill) are not covered by FUND.

The CRISTAL agreement covers pollution damage and preventive measures in a similar fashion. However, CRISTAL also explicitly includes pure-threat situations, defined as "a grave and imminent danger of the escape or discharge of oil from a tanker, which, if it occurred, would create a serious chance of pollution damage, whether or not an escape or discharge in fact subsequently occurs."

CRISTAL is a compensation source of last resort, and specifically will not pay any costs or damages covered by FUND. Damages covered are those not otherwise recoverable from the tanker owner, any other liable vessel or person, or any other source of compensation including a fund based on assessments against oil companies. The Institute administering CRISTAL has the right to make rules and directives with respect to interpretation of the contract.

Limits of Liability. The IOPC Fund's liability is limited to a total of 675 million gold francs, or $49.6 million at end-1982 exchange rates, including any sum paid under CLC (see Exhibit I-4). This level was raised in 1978 from the original figure of 450 million francs. By a three-quarters vote of the FUND Assembly, this limit can be raised to a maximum of about $66 million (900 million francs).

The IOPC Fund also indemnifies the shipowner for CLC liability above 1,500 gold francs ($110) per ton of the ship's convention tonnage or 125 million gold francs ($9.2 million), whichever is less. This applies only to vessels flying the flag of a FUND-member nation. This "rollback" concept originated as a compromise between shipowners and oil companies, because the shipowners felt that they had been burdened when the CLC limits were established at 2,000 francs per ton, which was double the 1,000 francs per ton level adopted in the 1957 Liability Convention. The rollback thus splits the difference between the oil companies and shipowners.

The CRISTAL agreement offers a maximum of $36 million per incident, including payments by all other sources. This was raised from $30 million in 1978, and the agreement permits the maximum to be raised as high as $72 million.

CRISTAL also provides a rollback to the shipowner for CLC liability above $120 per convention ton or $10 million, whichever is less. It also indemnifies the owner to the same limits for liability under any legal regime other than CLC.

Defenses of Fund. FUND does not accept liability in cases of

a. War or hostilities,

b. No proof of ship-source spillage, or

c. Intentional or negligent act of the claimant.

The third of these defenses is claimant-specific, and is not absolute; the degree of liability can depend upon the degree of fault attributed to the claiment.

To the first and third of these defenses, CRISTAL adds exceptional natural phenomena, negligence of governments, and intentional act or omission by third parties. With regard to the indemnification of the shipowner, the IOPC Fund is exonerated from its obligations if, as a result of the actual fault or privity of the owner, the vessel did not comply with international safety and pollution requirements and this noncompliance wholly or partially caused the incident. CRISTAL will not pay if an owner's recklessness or willful misconduct caused the incident.

Administration. The IOPC Fund is administered by a small secretariat housed at IMO headquarters in London. The staff presently consists of the Director, two assistants, and three

secretaries. Total administrative expenses of the Fund were budgeted at L222,000 ($360,000) for 1982. The Director conducts IOPC Fund operations, and is authorized to agree on final settlements himself where the total amount does not exceed 25 million francs (or $1.8 million) per incident.

An Executive Committee, presently consisting of nine members' representatives, has the tasks of approving settlements of claims against the Fund, providing instructions to the Director and supervising his work, and publishing an annual report of the Fund's activities. One half of the seats on the Executive Committee are assigned to the top oil receiving nations, and the remaining seats are distributed on an equitable geographic basis which represents both tanker owning nations and countries exposed to the risks of oil pollution.

The FUND Assembly consists of all the contracting states to the convention, presently 27 states. The Assembly has a policy-making role of adopting budgets and procedures, appointing the Director, fixing the annual contributions, and generally supervising the proper execution of the convention. It meets at regular sessions scheduled at least once a year.

CRISTAL is administered by the Oil Companies Institute for Marine Pollution Compensation Limited, organized in Bermuda. The Institute's main work is conducted out of London with a staff of three persons, including the President. Two staff members are based in Bermuda. The net administration costs of CRISTAL have averaged $270,000 per year over the 1971 to 1981 period.

CRISTAL's Board of Directors is composed of 15 members, representing the oil companies who are parties to the agreement. The Board is responsible for broad policy decisions, and must approve claims settlements and payments. The Institute has observer status with the IMO, and participates in the deliberations of the IMO Legal Committee involving the CLC and FUND conventions.

<u>Claims Procedures</u>. The IOPC Fund has prepared a brief claims manual, and its requirements are very straightforward. Claims for damage exceeding the owner's liability must be brought against the Fund within three years of the date when the damage occurred. The claim must be supported in writing and provide details of the incident, type of pollution damage, and the amount of the claim. In the case of smaller incidents, the Fund's Director can deal quickly with compensation payments. In more complex incidents, the Fund generally retains the services of surveyors and claims adjusters to review the validity of all claims submitted.

CRISTAL does not have a specific format for compensation claims, although written notice of claim must be received by the Institute within one year of the date of the incident. CRISTAL is a fund of last resort, and hence does not make payment until all other sources have paid and any legal questions concerning liability have been resolved. This tends to lengthen the elapsed time of settlement (see Chapter II).

C. DESCRIPTION OF U.S. LAWS

United States oil pollution liability and compensation law consists of a fabric of federal and state statutes, maritime law, common law, and judicial decisions. This patchwork of laws results in a variety of liability for oil spill consequences for different parties involved in the transportation and handling of oil subject to their jurisdiction. Frequently the provisions of different laws present dramatic inconsistencies.

This section provides a brief description of federal and a representative state law, and an analysis of a few critical issues of how the different laws relate to each other.

1. Introduction

Depending on who you are and the damages and cleanup costs for which you are seeking recovery, U.S. law provides many remedies. In this description and analysis, these remedies and related duties and liabilities are grouped into five categories: maritime and federal common law, early (pre-1970) federal statutes, federal statutes since 1970, state statutes, and the federal court decisions since 1970 construing the new federal statutes and their relationship to the other three categories. The diverse range of federal recovery possibilities is suggested by Exhibit I-6.

The major theories for recovery by those suffering loss or damage from oil pollution are briefly summarized below.

2. Maritime and Federal Common Law

Prior to 1970, any claimant, including the Federal and State governments, would have had to attempt to recoup cleanup costs and recovery for damages caused by oil pollution via an action under maritime tort or maritime nuisance theories, a common law

tort theory or under the so-called Refuse Act (Rivers and Harbors Act of 1899, 33 U.S.C. 407), or other early federal statutes referred to in the next subsection.

Under the U.S. Constitution, maritime, or admiralty, law is a subject for the exclusive original jurisdiction of the federal courts. Over the years, those courts have developed a large body of judge-made laws building on traditional maritime law concepts which, taken together with Congress's statutory enactments on maritime subjects (including laws implementing treaties) comprise U.S. maritime law. In pollution matters, reference is also sometimes made to federal common law, a body also of judge-made law construing other federal statutes, regulations, and treaties to which the U.S. is a party.

Maritime Tort Theory of Recovery

At the end of the 1960s, the federal courts began to recognize oil pollution as a tort under general maritime law and to allow recovery for damages from it. (Maryland v. Amerada Hess Corporation, 350 F. Supp. 1060, 1064-65 (D. Md. 1972); California v. S.S. Bournemouth, 307 F. Supp. 922, 926-27 (C.D. Cal. 1969); and Burgess v. M/V Tamano, 370 F. Supp. 247 (D. Me. 1973). This recovery theory is part of the wider admiralty tort law. "Negligent conduct causing loss to others constitutes a traditional maritime tort." U.S. vs. Oswego Barge Corporation, 664 F.2d 327 (2d Cir. 1981), citing Pope & Talbot, Inc. vs. Hawn, 346 U.S. 406, 413 and n.6 (1953).

In such cases, negligence or intentional conduct that falls below accepted standard must be shown. However, according to some courts, unseaworthiness alone of the discharging vessel is sufficient to establish liability. In the former cases, the defendant's actions must be shown to be the actual cause of the pollution, and there can be recovery for both costs of cleanup and for other damages.

However, the shipowner generally is recognized to be able to seek to limit his liability under the terms of the Limitation of Liability Act of 1851 to the value of the vessel after the accident and "her freight then pending," whenever the incident causing damage was not within the "privity or knowledge" of the vessel owner (see Appendix B). When the incident is within the privity or knowledge of the vessel owner, recovery for the full damages is allowed.

In a recent case, additional restrictions as to the kinds of damages were presented. In Burgess vs. M/V Tamano, coastal fishermen, clam diggers, and an association of businessmen in the coastal community of Old Orchards Beach, Maine, all sought damages for losses resulting from a spill in Maine's coastal waters. The parties there agreed with the court that the spill occurring in Maine's coastal waters constituted a maritime tort and that there was no "statutory or traditionally established federal admiralty rule governing the issues presented" by the motion of the defendant to dismiss the fishermen's, clam diggers', and businessmen's claims for damages (as opposed to recovery of cleanup costs). The federal district court in Tamano was of the opinion that title to Maine's coastal waters and marine life, including the seabeds and the beds of all the tidal waters, is vested in the State of Maine, and that individual citizens have no separate property interests therein. It wrote further that the right to harvest clams and to fish therein was not the right of private individuals but a public right held by the state "in trust for the common benefit of the people." The public right asserted by the state on behalf of its people has been commonly referred to as parens patriae and has been recognized by courts as providing states with standing to sue for oil pollution damage. Thus, the rights of the fishermen and the clam diggers to recover damages "depends upon whether they may maintain private actions for damages based upon the alleged tortious invasion of public rights which are held by the State of Maine in trust for the common benefit of all the people." In order to so maintain such a right to recovery, the court said that the private individual must show that he has "suffered damage particular to him--that is, damage different in kind rather than simply different in degree than that sustained by the public generally." And the court so found that the commercial fishermen and the clam diggers did have sufficiently "particular" damage to support their own private actions.

However, the court found that the Old Orchard Beach businessmen claimants did not have a right to recover. They were not asserting any interference with a direct exercise of a public right. They were only complaining of a loss of customers indirectly resulting from the alleged pollution. And the injury of which they complained was derivative from that of the public at large, that is, it was common to all businesses and residences of the area. Therefore, as they did not have any particular right of the kind required, these claims were dismissed.

The Tamano case shows that the right of individual citizens to recover under a maritime tort theory for damages suffered from oil pollution is going to be scrutinized by courts particularly if direct property rights are not involved or if economic loss is less than direct.

Some commentators also recognize a recovery in oil pollution cases under common law as well as maritime law.

> "In the United States, a party who suffers damage caused by oil pollution--such as a shoreside property owner--may bring action against the offending vessel under Common Law and the general principles of maritime law . . . . relief for pollution damage of common law was to be found in the Writ of Trespass quare clausum fregit and in the subsequent development of actions based on nuisance, fault and liability and the doctrine of res ipsa loquitur. (James J. Higgins, Pollution: International Conventions, Federal and State Legislation, 53 Tulane Law Review 1328, 1337)

However, at least one federal appellate court, the Second Circuit in the Oswego case, suggests that when the essential facts supporting the legal theories are "that a vessel discharged oil in navigable waters in the United States, the United States incurred costs in cleaning up the oil from those waters," that it is maritime law that provides the available federal remedies. "The facts satisfy the elements of admiralty jurisdiction--the maritime locality in a significant relationship to a traditional maritime activity. (Citation omitted.) Whatever federal liabilities arise from these facts, only maritime law, both judge-made and statutory, creates them." U.S. v. Oswego Barge Corporation, 664 F.2d 327, (2d Cir, 1981). It may be, however, that the common law recovery might be available in state courts as opposed to Federal courts. The area is murky. For purposes of this analysis, further reference is made only to maritime law theories.

Maritime Nuisance Theory of Recovery

The evolution of actions based on nuisance referred to in the above quote was developed at about the same time as a source of recovery for oil pollution damage (Illinois vs. City of Milwaukee, 406 U.S. 91, 106-107 (1972).

> "In order to recover damages for an oil spill, under a nuisance theory, a plaintiff must show that the spill is properly termed a nuisance and that he has suffered 'special damages'. A plaintiff need not establish that the defendant intentionally caused the oil spill; rather the plaintiff need only show that the oil spill unreasonbly interferes 'with a right common to the general public' and thus constitutes a public nuisance. One court, however, has held that a single oil spill is

> not a nuisance because it is not an event of a continuing and recurring nature. In addition to establishing the existence of a nuisance, when a nuisance affects the public at large--as it would in the case of a major oil spill--the plaintiff must further demonstrate that his damage is different from that suffered from the public." (Citations omitted.) (Comment: "Federal Water Pollution Control Act--The Federal Government's Exclusive Remedy for Recoupment of Oil Spill Cleanup Costs," 53 Tulane Law Review, 1421, 1423 (1979)).

Recovery under both maritime tort and maritime nuisance theories would also presumably be subject to the Limitation of Liability Act (see Appendix B).

Although the U.S. Supreme Court has "required that such suits be prosecuted only under federal common law of public nuisance," since it wants to impose a uniform standard in such suits (Comment, 53 Tulane Law Review 1421, 1423), Judge Newman in the Oswego case seemed to bring such a theory under maritime law as opposed to federal common law. "Whether non-negligent conduct amounting to a public nuisance creates a liability within a maritime law is more debatable, but this type of 'maritime nuisance tort' has been recognized. (Citations omitted.) We therefore conclude that both of the Government's nonstatutory theories of recovery are based on liabilities arising from judge-made maritime law."

3. Early Federal Statutes

In addition to the judge-made law just described, there existed prior to 1970 at least four federal statutes that bore on the compensation and liability matters. Two, both 19th-century enactments still in effect, are significant.

The Limitation of Liability Act. In 1851, Congress passed the federal Shipowner's Limitation of Liability Act (46 U.S.C. 181-189) which provides that if the ship suffered an incident causing damage to property the owner's liability shall not "exceed the amount or value of the interest of such owner in such vessel, and her freight then pending" provided that the accident had been "occasioned or incurred without the privity or knowledge" of the vessel owner. Later Supreme Court decisions construed the act to mean the value of the vessel after the incident and that any insurance funds received by the owner for loss are not part of the "value" and so not available to claimants against the owner. (Norwich Co. v. Wright, 80 U.S. (13 Wall) 104 (1871) and Place v. Norwich and N.Y. Transp. Co., 118 U.S. 468 (1885), Dyer v. National Steam Navigation Co., 118 U.S. 507 (1885).

While such provisions may well have suited Congress's intent in 1851 to strengthen the competitive position of the U.S. merchant shipping fleet, they are now criticized as inappropriate limitations on liability for widespread oil pollution.

Refuse Act. Section 13 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 407) is a possible third alternative remedy for oil pollution property damage other than the FWPCA and other statutory remedies reviewed below. The Rivers and Harbors Act is one of the nation's first regulatory efforts, dating back to the turn of the century. It is a statute imposing fines as well as civil penalties for its violation. The full act covers situations other than disposal of refuse, such as obstructions of navigable waters, and the deposit of materials of any kind on the banks of any navigable waterway where it might be washed into the water. While in its explicit terms it does not provide for civil liability for cost recovery, the statute has been used by the Federal courts as an authority to fashion such remedies for the United States. It is a judicially created remedy, arising from a statutory basis, as opposed to a judicially created liability such as found to exist in the case of maritime torts and maritime nuisance. Three issues concern the role of the Refuse Act in marine oil spill liability and compensation law: Does the act provide a recovery remedy for government cleanup costs and/or damages? If so, is either still available since the passage of the FWPCA? And, if so, does the Federal Limitation of Liability Act apply? The first is briefly addressed here, while the second is discussed in Appendix A and the third in Appendix B.

As noted, courts have found that that part of the Rivers and Harbors Act known variously as the Wreck Removal or Wreck Act (33 U.S.C. 409, 411, 412, 414, 415) provides a basis for affording the U.S. government recovery of its costs in removing sunken vessels from owners whose negligence was alleged to have caused the wreck. (Wyandotte Transportation Company v. United States, 389 U.S. 191 (1967). In re Chinese Maritime Trust, Ltd., 361 F. Supp. 1175 (S.D.N.Y. 1972).

And Section 10 (33 U.S.C. 403) has similarly been found as an appropriate basis for recovery of costs of removal of an obstruction (U.S. v. Perma Paving Company, 332 F.2d 754 (1964).

The picture is less clear as to cost recovery Section 13, the Refuse Act (33 U.S.C. 407) which prohibits the discharge of "any refuse matter of any kind or description whatever" from a vessel or the shore "other than that flowing from the streets and sewers and passing therefrom in a liquid state." In the 1960's, the Supreme Court found the act applicable to a spilled petroleum product (United States v. Standard Oil, 384 U.S. 224 (1966) and

other industrial waste (United States v. Republic Steel Corp.) 362 U.S. 482 (1960). And in 1973, a lower court used it as a basis for injunctive relief in an oil pollution case, United States v. Ira S. Bushey & Sons, Inc. 363 F. Supp. 110 (1973). In the first two years of the EPA (which began operations in 1970), over 250 criminal prosecutions or civil actions seeking injunctions requiring adoption of pollution abatement measures were brought by the government under the Refuse Act. Described as covering "industrial pollution", they may have included oil pollution. See Robert Zener, The Federal Law of Water Pollution Control, in Federal Environmental Law. (Interestingly, it has been referenced in a private damages suit in which the issue was negligence in creating an obstruction caused by deposits of sand and silt, Gulf Atlantic Transp. Co. v. Becker County Sand and Gravel Company 122 F. Supp. 13 (1954)).

However, the Refuse Act has apparently yet to gain court acceptance as a continuing basis for recovery of government costs for oil spill removal, though the logic courts have used in moving from statutory criminal sanction to injunctive relief to providing cost recovery of the government's doing the removal itself, as argued in applying other sections of the Rivers and Harbors Act (see Perma Paving), seems pertinent. A major reason is that the Refuse Act, along with judge-made liability theories, has been held by several Federal courts to be preempted by the FWPCA and thus no longer available, as applied to government's efforts to recover cleanup costs (see Appendix A).

Several other statutes enacted prior to 1970 should be noted. The Oil Pollution Act of 1924 (43 Stat. 604-06) barred "discharges of oil by any method . . . into or upon the coastal navigable waters" of the U.S. and gave the Secretary of War authority to regulate discharges through permitting and to regulate loading, handling, and unloading of oil. However, the Secretary did not exercise these authorities and the act was considered not effective in reducing oil pollution. It was amended in 1966 by the Clean Water Restoration Act of 1966 (80 Stat. 1252-54 (1966) codified at 33 U.S.C. 431-37 (Supp. 1965-1968)), which established the responsibility of the vessel owner to clean up discharges caused by gross negligence or the willful acts of master or crew. Both the 1924 act and its amendment were superseded by the passage of the Water Quality Improvement Act in 1970.

The Oil Pollution Act of 1961 (33 U.S.C. 1001-15 (1970)) implemented for the U.S. the 1954 Oil Pollution Convention (12 U.S.T. 2989). The convention with its several amendments addresses the deliberate oil discharges made by tankers and other vessels.

Finally, the Congress in 1948 passed the original Federal Water Pollution Control Act (FWPCA) (Pub. L. No. 80-845, §5, 62 Stat. 1155). It, too, remained ineffective as a basis for establishing liability and compensation for oil spill damages until amended in 1970 and 1972. In summary, at the end of the 1960s, the U.S. had no effective legislative program in this area. The 1966 Clean Water Restoration Act had, however, established the concept of shipowner responsibility for cleanup costs.

4. Federal Statutes Since 1970

The Water Quality Improvement Act of 1970

The Water Quality Improvement Act of 1970 (Pub. L. No. 91-224, 84 Stat. 91) added two new sections, §11 and §12, to the FWPCA. The first dealt with oil pollution and the second with hazardous polluting substances. Both were applicable to U.S. navigable waters and the U.S. contiguous zone. Their major provisions were carried over into §311 of the FWPCA as amended in 1972; the provisions concerning hazardous substances were folded into those concerning oil pollution.

Federal Water Pollution Control Act Amendments of 1972

This statute (Pub. L. No. 92-500, 86 Stat. 816, codified at 33 U.S.C. (1976)) comprises the centerpiece of present day federal oil pollution liability legislation. For the purposes of this description, additional amendments passed in 1977 under the title, The Clean Water Act (Pub. L. No. 95-217, 91 Stat. 1566 (1977)) and in 1978 (Pub. L. No. 95-576, 92 Stat. 2467) are included in what follows. (The whole is now codified at 33 U.S.C. §§1251-1376; section 1321 deals with Oil and Hazardous Substances Liability.)

The act declares it to be a national goal that the discharge of pollutants in the navigable waters of the United States be eliminated in 1985. As to oil and hazardous substances, section 1321 declares the policy that there be no such discharges into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone or in connection with activiites under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or any discharges which may affect natural resources covered by the Fisheries Conservation and Management Act of 1976. Different parts of the

act are administered by the Coast Guard and the EPA (functions formerly carried out by the Federal Maritime Commission have been transferred to the Coast Guard). The act covers discharges of "oil of any kind or in any form, including but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with waste other than dredged spoil." And the discharge as defined is including but not limited to any spilling, leaking, pumping, pouring, emitting, emptying or dumping. Discharges subject to the act are those in the navigable waters of the U.S., those covered by the Outer Continental Shelf Lands Act, the Deepwater Ports Act of 1974, or the area covered by the exclusive management authority of the Fisheries Conservation and Management Act of 1976, that is, a 200-mile seaward zone.

The discharger of a spill is required to notify the Coast Guard or EPA. If the discharger fails to clean it up or if the spiller is unknown, the federal government cleans up, and in such a case, the vessel owner/operator is strictly liable to the government for actual costs incurred. Liability is limited to the greater of $150 per gross ton or $250,000 for a vessel carrying oil or hazardous substances as cargo (see Exhibit I-7). The limit of liability applicable to an inland oil barge is $125 per gross ton or $125,000, whichever is greater. Other vessels have a $150 per gross ton limitation. Spillers may avail themselves of four defenses: that the discharge was caused solely by (A) an act of God, (B) an act of war, (C) negligence on the part of the United States government, or (D) an act or omission of a third-party whether such act or omission was or was not negligent, or any combination of the foregoing clauses. The limits to liability provided may be denied, that is, limitation broken, where the federal government can show that a discharge was the result of "willful negligence or willful misconduct within the privity and knowledge of the owner."

The act authorizes a $35 million revolving fund financed from Congressional appropriations, recovery of cleanup costs, and criminal and civil penalties under section 311 (see Exhibit I-8). The fund is available to directly finance oil spill removal and to reimburse the Coast Guard and other federal agencies, as well as state agencies as provided under the National Contingency Plan, when such agencies remove spilled oil covered by the act. The fund is also available to the discharger, when such discharger cleans up and then can show that discharge was caused solely by an act of God, an act of war, negligence on the part of the U.S. government, or an act or omission of a third party (without regard to whether such act or omission was or was not negligent) or any combination (that is, the same situations comprising the discharger's defenses). In practice, Congressional appropriations have paid for $75 million out of the total

$124 million expended from the FWPCA (311 k) revolving fund during the fiscal years 1971-1982. It is not possible to state what portion of the unrecovered costs were due to tanker oil spills as opposed to other land or water pollution incidents. In addition to the fund, the act also requires vessel and barge owners to establish evidence of financial responsibility in amounts sufficient to meet the limits to which their liability extends. This may be done by insurance, surety bonds, self-insurance or other means. There is a civil penalty to which a vessel owner or operator is subject of up to $5,000 for any unlawful discharge. Failure to notify, however, creates a criminal responsibility and a maximum fine of $10,000 or imprisonment for not more than a year, or both.

The Trans-Alaska Pipeline Authorization Act of 1973. In November 1973 Congress passed this act (TAPA). In regard to coverage, as to vessel owners and operators, the act covers "oil that has been transported through the trans-Alaska pipeline" and on vessels operating "between the terminal facilities of the pipeline and ports under the jurisdiction of the United States." Coverage is for "all damages, including cleanup costs, sustained by any person or entity, public or private, including residents of Canada, as a result of discharges of oil" from the vessel. Liability is strict, without regard to fault. Parties can defend against their liability in cases where damages "were caused by an act of War or by negligence of the United States or other governmental agency." The act does not include two defenses available under the 1972 act, that is, an act of God, and an act or omission of a third party. In the latter case, the defense is available against claims by that third party if negligence by that third party can also be proven. The vessel owner or operator bears liability up to $14 million "jointly and severally." Above that, a fund takes responsibility up to $100 million maximum.

TAPA additionally establishes responsibility of the holder of the pipeline right of way in two instances which may be indicative of Congress' attitude toward pollution at the time of the legislation. The holder is "strictly liable to all damaged parties, public or private, without regard to fault" for damages "in connection with or resulting from activities along or in the vicinity of the proposed . . . right-of-way . . ." Liability is limited to $50 million for any one incident. Second, the holder is financially responsible for the control and removal of any pollutant caused by "any activities conducted by or on behalf of the holder" if "such pollution damages aquatic life, wildlife, or public or private property . . ."

The Trans-Alaska pipeline liability fund is designed to total $100 million and to provide for compensation for damages exceeding $14 million. It is financed by a $.05 per barrel fee

collected by the pipeline operator from the oil owner at the point of loading. In practice, this fund has not yet been required.

In addition, evidence of financial responsibility is required up to the vessel owner's potential liability of $14 million.

The act makes clear that it is not intended to pre-empt state laws, nor the field of strict liability, nor intended to preclude any state from imposing additional requirements.

The Deepwater Port Act of 1974. The Deepwater Port Act of 1974 was established in 1974 in anticipation of the need to create port facilities for deep draft tankers. It adds to the whole oil spill compensation scheme, although the number of deep water ports to date is limited to one. The act itself is limited to such ports, prohibiting oil discharges from a vessel within any safety zone (created by the act), a vessel which has received oil from another vessel at a deepwater port, or from the deepwater port itself. The pattern of liability follows that in the TAPA Act. The vessel owners and operators, and licensees of the port facilities, are strictly liable "without regard to fault" for cleanup costs and damages resulting from the discharge of oil. That is, the vessel owner/operator is liable for any "discharge of oil from such vessel within the safety zone, or from a vessel which has received oil from another vessel at a deep water port." On the other hand, the licensee is liable for discharges "from a vessel moored at such deepwater port" and from the deep water port itself. As indicated above, the liability in both cases is strict liability, without regard to fault. Only two defenses are available, an act of war and negligence on the part of the federal government in establishing and maintaining aids to navigation. Here, the defense relating to the federal government is further narrowed in that it must be negligence in establishing and maintaining aids to navigation. Also if the spiller can show that the damage was caused solely by the negligence of a third party who is claiming damages itself, neither the owner/operator nor the licensee is liable to that party. Licensees' liability is limited to $50 million per incident and vessel owners and operators are limited to the lesser of $150 per ton or $20 million. These limits are removed and liability is unlimited if the discharge occurred because of "gross negligence or willful misconduct within (his) privity and knowledge."

A fund, the Deepwater Port Liability Fund, also is fed by a tax, this time a $.02 per barrel fee collected by the licensee from the "owner of any oil loaded or unloaded at the deepwater port." The fund's aim is to total $100 million. The fund can

defeat payment against claims by parties whose negligence caused the damage but neither the defense of act or war or negligence of the federal government is available to it. In practice, this fund has not yet been required (see Exhibit I-9).

Outer Continental Shelf Lands Act Amendments of 1978 (OCSLAA). The most recent of the major pieces of legislation dealing with oil spill liability and compensation is this act which radically revised the statutory regime for management of offshore natural resource exploitation in 1978. As to oil spill compensation and liability, the act extends strict liability to owners and operators of any offshore facility in the outer continental shelf or vessel carrying oil produced on the Continental Shelf which "causes or poses an immediate threat of oil pollution."

The scheme distinguishes between costs of cleanup or removal and other damages. As to the former--cleanup costs and any other costs incurred under the FWPCA sections dealing with cleanup-- and the Intervention on the High Seas Act, the act provides that the vessel or facility owner or operator is absolutely liable and without limitation for all such costs. The language is "all costs of removal incurred by the Federal government or any state or local official or agency in connection with the discharge of oil from any offshore facility or vessel [subject to the act]." An owner and operator of a vessel are jointly and severally liable under Section 304(b) of the act for cleanup costs and damages up to an amount of $300 per gross ton or $250,000, whichever is greater, and for an offshore facility owner or operator, $35 million for damages plus all government removal and cleanup costs. Furthermore, Section 304(d) of the act contains an ambiguity in that it purports to provide that not withstanding the limitations in Section 304(b) or the defenses in 304(c), all government removal costs shall be borne by the owner and operator of the vessel or facility from which the discharge occurred.

The dischargers may avail themselves of total defenses if the discharge was solely caused by an act of "war, hostilities, civil war, or insurrection or by an unanticipated grave natural disaster, or other natural phenomenon of an exceptional, inevitable, and irresistable character, or solely by the negligent or intentional act of the damaged party or any third party including government agencies." Thus, while liability under this act is perhaps the most comprehensive of the schemes referred to herein, the defenses permitted to be raised are also fairly broad. Furthermore, limitation of liability may be denied in certain circumstances with the result that the discharger's liability would be unlimited. In other words, limitation may be denied when the incident is caused by willful misconduct or gross negligence or

violation of safety, construction, or operating standards or regulations of the Federal government, within the privity or knowledge of the owner or operator, or where an owner or operator refuses to provide requested cleanup assistance. Thus, under OCSLAA, it may well be more difficult for a shipowner to sustain the limitation of liability provided for therein.

Here, again, a fund is established to cover the instances where damages exceed the requirements for payment by the discharging parties, but the fund has not yet been used (Exhibit I-9). The Offshore Oil Pollution Compensation Fund is authorized to reach $200 million and is financed by a fee of not more than $.03 per barrel imposed on the owner of the oil when it is produced. The envisaged goal of $200 million may be increased to permit payments into the fund as provided by the Act. Also, the government is authorized to borrow if necessary to meet the obligations of the fund. The fund is liable, without limitation, for all losses for which a claim may be asserted under the act to the extent that all losses are not otherwise compensated. Financial responsibility requirements also exist under this scheme to equal the maximum amount of liability placed on the vessel or facility owner/operator in cases where they would be entitled to limit their liability under applicable provisions of the act. There are also criminal and civil penalties for failure to notify the Government of a discharge and failure to comply with financial responsibility requirements.

5. State Statutes

The recovery of removal costs by state governments under the provisions of federal law is very limited; many coastal states have passed their own legislation providing a variety of remedies for state costs and damages and for damages suffered by others.

The FWPCA, the main federal statute available, provides that the costs of oil removal for which the owner or operator of a vessel or facility is liable shall include costs of state governments in the restoration or replacement of damaged or destroyed natural resources and also that states shall act as trustee of these resources on behalf of the public. In addition, in mandating the estabishment of the National Contingency Plan, Congress required it to include a system whereby an affected state may act where necessary to remove a discharge and be reimbursed for its reasonable costs from the fund established by the act. The Plan, in turn, provides that in order for state action to be "necessary", the federal On-Scene Coordinator, in addition to finding that the owner or operator cannot effect removal properly (i.e., the condition for a "federal" removal), must determine either

that state action is required to minimize or mitigate significant damage to the public health or welfare which federal action cannot achieve or that the state's costs are less than or not significantly greater than the federal costs would be. And in order to qualify for reimbursements, state removal actions must comply with that part of the Plan detailing cleanup techniques and policies. State statutes creating liabilities and compensation procedures can usefully be examined in the context of these FWPCA provisions.

Most coastal states in the United States have passed some type of legislation dealing with oil pollution. Some of these have been general water pollution statutes that make specific provisions for oil spills, others deal with oil and hazardous substances while still other states have passed statutes focused wholly on oil. They include Alaska, California, Connecticut, Florida, Maine, Massachusetts, North Carolina, New Jersey, New York, Vermont, Virginia, and Washington. They vary considerably as to approach, but some indication is given by one survey (unpublished, dated 1980) of oil pollution liability and compensation provisions of twenty-three coastal states (not including Great Lakes states). It indicates that thirteen had established some sort of strict liability while an additional eight opted for absolute liability in that they provided polluters with no defenses. Fifteen did not set any financial limits on the liability, while six did. (The remaining two spoke in terms of the spiller's duty to clean up, with fines for failure). Fifteen also provided for recovery of the state's cleanup costs. Of the remaining, those costs were covered by one provision framed in terms of all cleanup costs, another in terms of the state's damages, two others in terms of requiring adjudication in the settlement of claims, while for the final four no information was provided. Twelve of the states had established some sort of compensation fund. Half of these were funded by a per unit charge on oil passing through the terminal or port while the remainder relied primarily on penalties, spiller reimbursements, appropriations and other fees.

The following illustrative description of Maine's law presents a not untypical state regime. In its Coastal Conveyance Act, the discharge of oil into or upon the coastal waters of the state is prohibited:

> Licenses are imposed on "oil terminal facilities" which are defined to include shore facilities used for off-loading or onloading of petroleum products and certain ships involved in vessel-to-vessel transfers of petroleum products taking place within a zone extending 12 miles from the shore. Those facilities that are

> capable of doing significant harm to the environment are prohibited from operating without a license. One of the most significant provisions of the statutory scheme holds licensees liable for all acts and omissions of their servants, agents, and carriers destined for the licensees' oil facilities during the time such carriers are within the State's waters. Negligence is not a prerequisite of liability, since the State need prove only the fact of the polluting condition and that it occurred at facilities under the control of the licensee or was attributed to others for whom the licensee is made responsible in the act. (Note, 29 Maine L. Rev. 47, 55 (1977)).

In Florida, a similar regime has been created by the 1970 Oil Spill Prevention and Pollution Control Act. Including its 1974 amendments, the key provisions of the Florida Act are that it imposes liability upon terminal facilities or vessels for pollutant spills in state waters. The liability to the state for cleanup costs is limited to $14 million or $100 per GRT for vessels. But there is absolute liability to private claimants for other damages without any limitation. A Coastal Protection Fund to guarantee prompt payment of claims is established, based on a 2 cent per barrel excise tax. Action can be brought directly against the insurer or other party providing evidence of financial responsibility. Finally, the normal defenses (act of war, act of God, act of government or of third party) are only conferred upon petition as a privilege, rather than as a right (F. Sisson, "Pollution Law and the Limitation of Liability Act," 9 J. of Mar. L. Comm. 285 (1978)).

6. Federal Court Decisions Since 1970

Sorting out the inconsistencies and conflicts among all the components of the body of liability and compensation law just described and the uncertainties caused by statutory vagueness has been the task of the U.S. federal district and appellate courts supplemented occasionally by state courts. Thus far, the Supreme Court has spoken to only a few of the issues.

The important issues fall into three categories. There are questions as to whether the FWPCA and the three other federal statutes preclude the federal government and other claimants from recovering under maritime or federal common law theories or under the Refuse Act, that is, the means available prior to the passage of the 1970's statutes. And there are questions as to whether the federal statutes preclude, or preempt, the state laws. These issues are examined in some detail in Appendix A. A second set

of questions concern the applicability of the Limitation of Liability Act to the different groupings of law described above. These issues are detailed in Appendix B. What follows is a summary.

For the federal government and states seeking recovery from dischargers under federal law, the major remedy for cleanup costs and costs of rehabilitation and restoration of natural resources is the FWPCA to which the three particular statutes serve as separate available remedies where they apply. In all cases, the Limitation of Liability Act does not apply. Apparently, the government is free to pursue remedies for damages other than the above under maritime torts or nuisance theories, where the Limitation of Liability Act would apply, and possibly under the Refuse Act. States could also follow the above routes or go under their own statutes where applicable, where current case law suggests the Limitation of Liability Act would apply unless means were taken to avoid it, such as Maine's vicarious liability provision. Other parties, such as property owners, could seek recovery for all cleanup costs and damages under the three particular federal statutes (no Limitation of Liability Act), or under maritime tort or nuisance theories (Limitation of Liability Act applicable), or under applicable state statutes (where, again, the Limitation of Liability Act most probably would apply unless artfully avoided). Under the federal recoveries of the 1970s, a choice among remedies would have to be made.

Exhibit I-1

SUMMARY CHARACTERISTICS OF CLC AND TOVALOP

	CLC	TOVALOP
PURPOSE	Establish uniform international regime under which tanker owners have strict liability for oil pollution damages and cleanup costs	Provide benefits and protection generally comparable to those available under CLC, pending its widespread application
STATUS	International treaty creating legal regime in nations that have ratified; in force since June 18, 1975	Voluntary agreement among tanker owners; in operation since 1969, amended June 1, 1978
MEMBERSHIP	[illegible]1 countries	3,200 companies, 6,567 tankers, 182 million gross tons—virtually all of the world's fleet
COVERAGE	• Seagoing vessels carrying oil in bulk • Applies to pollution damage caused on territory or in territorial sea of CLC country • Covers damages and cleanup costs, but only costs incurred following actual spill	• Seagoing tankers, laden or in ballast, owned or bareboat chartered by TOVALOP party • Applies to pollution damage caused on territory or in territorial sea of a country except when CLC applies to the damage • Includes costs incurred in case of a threat of oil discharge
OILS	Persistent oil (including whale oil), carried as cargo or bunkers, but only while vessel is laden	Persistent hydrocarbon oils, carried as cargo or bunkers, on laden or ballast voyages
LIABILITY LIMITS	Stated in gold francs or SDRs; equivalent to $147 per convention ton with maximum $15.4 million per incident, absent actual fault or privity of owner, at December 31, 1982, exchange rates	$160 per convention ton, maximum $16.8 million per incident
EXCEPTIONS	War, exceptional natural phenomenon, intentional act or omission by third party, negligence by government regarding aids to navigation or lights	Same as CLC
ADMINISTRATION	Governments of member countries	International Tanker Owners' Pollution Federation Limited, on behalf of tanker owner members
FINANCIAL RESPONSIBLITY	Certificate from member government of registry regarding sufficient financial coverage	Maintained to satisfaction of Federation
CLAIMS PROCEDURE	Actions brought in court of member country suffering pollution damage; limitation fund must be established	In case of dispute, arbitration by International Chamber of Commerce

SOURCE: International Convention on Civil Liability for Oil Pollution Damage, 1969; and Tanker Owners' Voluntary Agreement Concerning Liability for Oil Pollution.

Exhibit I-2

CLC MEMBERSHIP

As of May 1983, there were 51 Contracting States to the International Convention on Civil Liability for Oil Pollution Damage:

Algeria	Liberia
Bahamas	Maldives
Belgium	Monaco
Brazil	Morocco
Chile	Netherlands
China	New Zealand
Denmark	Nigeria
Dominican Republic	Norway
Ecuador	Panama
Fiji	Papua New Guinea
Finland	Poland
France	Portugal
Gabon	Senegal
German Democratic Republic	Singapore
Germany, Federal Republic of	South Africa
Ghana	Spain
Greece	Sweden
Guatemala	Syrian Arab Republic
Iceland	Tunisia
Indonesia	Tuvalu
Italy	United Kingdom
Ivory Coast	USSR
Japan	Vanuatu
Korea, Republic of	Yemen
Kuwait	Yugoslavia
Lebanon	

Source: IMO.

Exhibit I-3

GRAPH OF CLC/FUND AND
TOVALOP/CRISTAL REGIMES

(Values as of December 31, 1982)

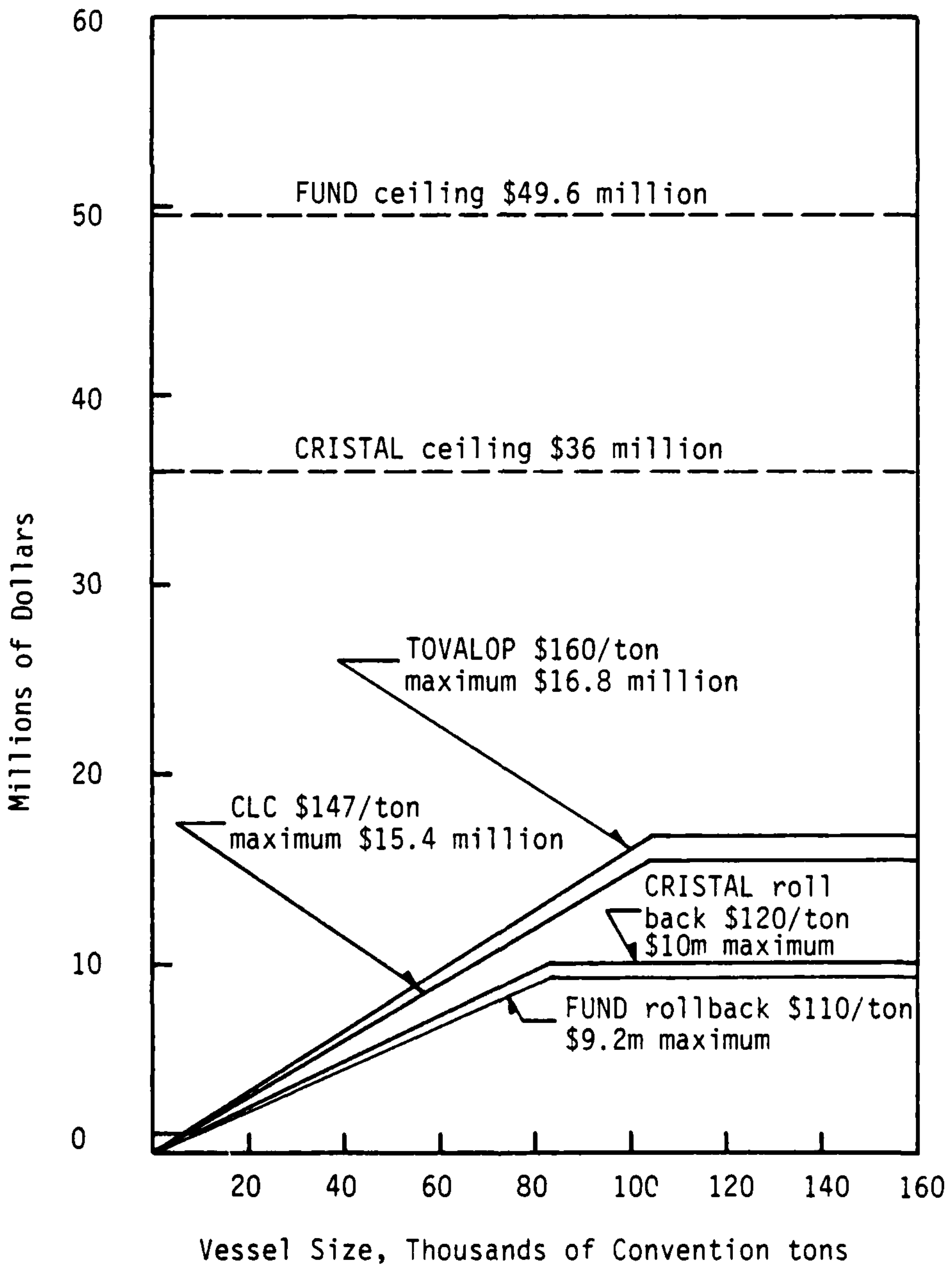


Exhibit I-4

SUMMARY CHARACTERISTICS OF FUND AND CRISTAL

	FUND	CRISTAL
Purpose	Provide supplementary compensation, beyond CLC, to ensure full coverage of pollution damages, paid for by oil cargo interests	Provide supplemental compensation beyond CLC and TOVALOP, on an interim basis until FUND is widely accepted.
Status	International treaty binding on nations that have ratified; entered into force October 16, 1978.	Voluntary agreement among oil companies, revised on June 1, 1978.
Membership	27 nations at present.	800 oil companies
Coverage	As per CLC.	Vessel coverage similar to TOVALOP. Does not apply to damages in FUND nations. Applies only as last recourse. Cargo must be a CRISTAL-owned or deemed cargo.
Oils	Persistent hydrocarbon mineral oil.	Persistent hydrocarbon mineral oil.
Limits	Combined CLC/FUND maximum of $45 million SDRs, equivalent to $49.6 million at end-1982 exchange rates. Indemnification available to tanker owner, if vessel registered in FUND nation, for damages above about $110 per convention ton or $9.2 million maximum.	Combined maximum from all sources, including CRISTAL, is $36 million per incident. Indemnification available to tanker owner, if not eligible for FUND rollback, for damages above $120 per convention ton or $10 million maximum.
Exceptions	War, lack of proof of ship-source spillage, or intentional or negligent act of claimant.	War, exceptional natural phenomena, wholly carried by act or omission done with intent to damage by claimant or other party, or wholly caused by government negligence in maintaining navigational aids.
Financial arrangements	Contributions based on oil receipts. Initial contribution is about one-third U.S. cents per ton of oil received in year preceding adherence. Continuing contributions based on spill claims experience. Receipts include crude oil and fuel oil of ASTM No. 4 or heavier. Oil receiving companies (or countries) pay.	Contributions based on oil receipts. Continuing contributions based on spill claims experience. Receipts include crude oil and fuel oil. Oil cargo owners pay.
Administration	IOPC Fund secretariat (three professionals) Executive Committee (nine nations) FUND Assembly (all member nations have equal votes)	Oil Companies Institute for Marine Pollution Compensation Ltd. (total staff of five persons). Institute Board of Directors (15 oil company members).
Claims procedure	Submit written claims within three years. FUND Assembly approves payment over $1.8 million.	Submit written notice of claim within one year of incident.

Source: International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971; and Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution, 1971.

Exhibit I-5

FUND MEMBERSHIP

As of May 1983, there were 27 Contracting States to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage:

Algeria
Bahamas
Denmark
Fiji
Finland
France
Gabon
Germany, Federal Republic of
Ghana
Iceland
Indonesia
Italy
Japan
Kuwait
Liberia
Maldives
Monaco
Netherlands
Norway
Papua New Guinea
Spain
Sweden
Syrian Arab Republic
Tunisia
Tuvalu
United Kingdom
Yugoslavia

Source: FUND.

Exhibit I-6

SUMMARY OF RECOVERY REMEDIES AVAILABLE TO DIFFERENT CLASSES OF CLAIMANTS

An * indicates that coverage as to claims against tanker owners would be replaced by CLC/Fund. An (L) indicates Limitation of Liability Act presumably applies.

Claimant / Recovery Under	U.S. Government	State Cleanup Agencies	Discharger of Oil	Others (Property Owners, Sufferers of Economic Loss, etc.)
Federal Water Pollution Control Act (FWPCA)	Actual cleanup costs and restoration and rehabilitation of natural resources*	Costs of restoration and rehabilitation of natural resources and, in certain circumstances, cleanup costs as provided in National Contingency Plan*	Reasonable cleanup costs under certain limited circumstances	- - -
Trans-Alaska Pipeline Authorization Act (TAPA)	Cleanup costs and damages involving vessels carrying Alaska Pipeline Oil*	Cleanup costs and damages involving vessels carrying Alaska Pipeline Oil*	- - - - - -	Cleanup costs and damages involving vessels carrying Alaska Pipeline Oil*
Deepwater Ports Act (DWPA)	Cleanup costs and damages at deepwater ports*	Cleanup costs and damages at deepwater ports*	Reasonable cleanup costs under certain limited circumstances*	Cleanup costs and damages at deepwater ports*
Outer Continental Shelf Lands Act Amendments (OCSLAA)	Cleanup costs and broad damages of established economic loss involving OCS oil*	Cleanup costs and broad damages of established economic loss involving OCS oil*	Cleanup costs and broad damages under certain limited circumstances*	Cleanup costs and broad damages of established economic loss involving OCS oil*
Refuse Act	Possibly damages other than cleanup and restoration and rehabilitation of natural resources*(L)	Possibly damages other than cleanup and restoration and rehabilitation of natural resources*(L)	- - -	- - -
Maritime Law Tort Theory	Damages other than cleanup and restoration and rehabilitation of natural resources costs*(L)	Damages including cleanup*(L)	- - -	Damages including cleanup*(L)
Maritime Law Nuisance Theory	Damages other than cleanup and restoration and rehabilitation of natural resources costs*(L)	Damages including cleanup*(L)	- - -	Damages including cleanup*(L)

Exhibit I-7

TANKER OWNER/OPERATOR
OIL POLLUTION LIABILITY LIMITS UNDER U.S. LEGISLATION

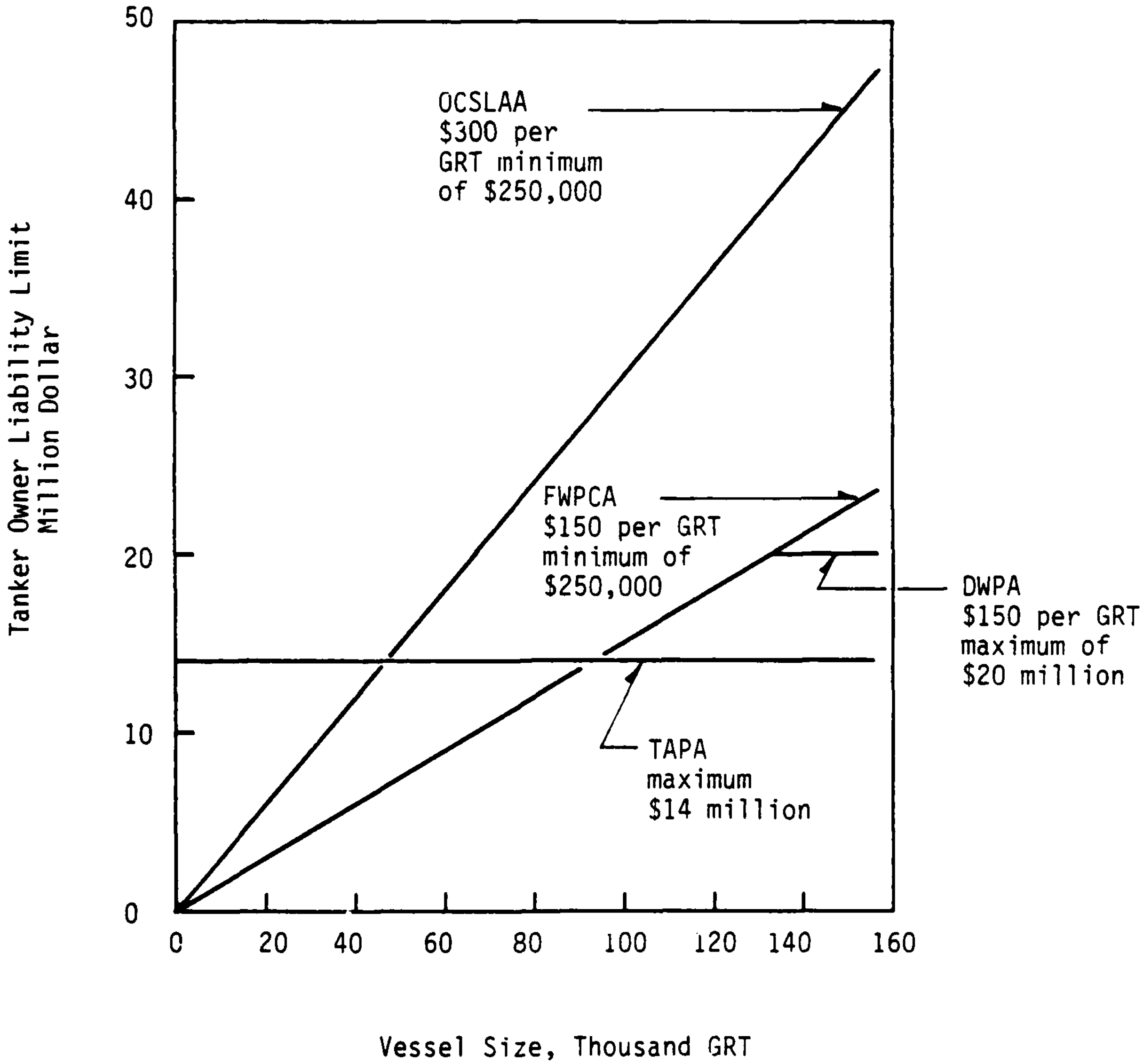


Exhibit I-8

FINANCIAL SUMMARY OF THE FWPCA 311(k) REVOLVING FUND

Fiscal Year	Annual Obligations of the 311(k) Fund	Appropriation	Collections
1971	$ 288,255	$20,000,000	$ 47,675
1972	892,292	-	311,536
1973	9,439,340	-	634,981
1974	4,429,964	-	2,410,741
1975	7,974,507	-	1,999,602
1976	15,318,823	10,000,000	3,650,788
1977	8,643,653	5,000,000[1]	6,888,149
1978	9,922,986	10,000,000	7,144,493
1979	18,741,710	(3,500,000)[2]	5,105,112
		13,000,000	
1980	25,197,136	10,000,000	5,473,096
		20,500,000	
1981	19,745,356	15,000,000	7,099,910
1982	3,754,490	-	8,263,191[3]
1983 (01/31/83)	401,083	(9,000,000)[2]	1,969,891
Total	124,749,595	91,000,000	50,999,165
Cumulative Total Resources			$141,999,165
Unobligated Balance (01/31/83)	$17,249,570		

[1]Transfer of Funds from USCG AC&I Appropriations.
[2]Transfer of Funds to USCG AC&I Appropriations.
[3]Corrected for $235,862 Treasury Dept. Error.

Source: U.S. Coast Guard (G-WER-4), March 1983.

Exhibit I-9

FINANCIAL SUMMARIES OF THE OFFSHORE
OIL POLLUTION COMPENSATION FUND
AND THE DEEPWATER PORT LIABILITY FUND

A. Offshore Oil Pollution Compensation Fund

Cumulative Receipts and Expenditures Since Establishment in July 1979:

Revenues

Barrel fee collections	$30.7 million
Interest earned	6.1
Total Receipts	$36.8 million

Expenditures

Actual costs to date of fund administration and management	$2.5 million

B. Deepwater Port Liability Fund

Cumulative Receipts and Expenditures Since Establishment in May 1981:

Revenues

Barrel fee collections	$2.7 million
Interest earned	0.172 million
Total Receipts	$2.9 million

Expenditures

Actual costs to date of fund administration and management	$64 thousand

Source: U.S. Coast Guard, March 1983.

II. THE REGIMES IN PRACTICE: LEGAL ASPECTS

Important practical differences arise between the public (CLC, FUND) and private (TOVALOP, CRISTAL) regimes because of their unequal legal status. The former regimes are based on international treaties, which have the status of law in those countries that have ratified the conventions; the latter are voluntary private agreements. This basic difference in legal status is reflected in different standards of applicability, the way in which limitation of liability is established, the practical possibility of denying limitation of liability, and the question of jurisdiction. These issues are discussed in this chapter; the insurance issues related to differing provisions and claims procedures are covered in Chapter III.

A. APPLICABILITY

The CLC and FUND Conventions form an internationally agreed-upon legal framework in member states. Their application does not depend on the actions of private parties. TOVALOP and CRISTAL by contrast are based on private agreements maintained in force on a voluntary basis.

1. Application to a Particular Spill

The application of the CLC and FUND Conventions depends primarily on the location of the spill damage, while TOVALOP and CRISTAL depend on whether the vessel and its cargo are owned by parties to the agreements. Thus, assuming a spill is of the type generally covered by both regimes, a spill in a non-FUND-member state may not necessarily be covered under CRISTAL. While 97 to 99 percent of the world's tanker fleet is entered into TOVALOP and CRISTAL's receipts represent approximately 93 to 95 percent of world crude oil and residual fuel oil transported by sea, there have been cases where CRISTAL compensation was not available. In the case of the ZOE COLOCOTRONI (1973), which caused pollution damage to a mangrove swamp in Puerto Rico, CRISTAL was not involved because it applied at that time only to cleanup costs and not to third-party claims. In another United States spill, the BURMAH AGATE in Galveston Bay in 1979, CRISTAL was not involved because the cargo at the time of the incident was not owned or deemed to be owned by a party to CRISTAL.

2. Permanence

CLC and FUND are established as international treaties to provide a permanent oil spill compensation system. Both conventions have provisions for denunciation, though with a time delay of one year, and in practice no nation has withdrawn from either convention. The Japanese oil companies were particularly dissatisfied with the FUND situation a few years ago, largely because of their heavy share of the FUND burden (31 to 38 percent), the large payments made in the ANTONIO GRAMSCI case in the Baltic, and their disappointment that the United States did not join FUND. However, the Japanese government resisted these pressures and today appears committed to remaining in FUND.

CRISTAL and TOVALOP, on the other hand, both contain clear statements of their temporary nature in the agreements themselves: CRISTAL in its name ("Contract Regarding an Interim Supplement . . "), TOVALOP in its preamble (". . . pending the widespread application of the Liability Convention . . ."). Both agreements provide that they shall not be dismantled retroactively, that is, to deny compensation to spill victims following an incident. But both agreements can be dissolved once the parties feel that the essential interim purpose has been accomplished, or whenever they tire of the financial burden that they have voluntarily assumed.

There are clear signs of oil company dissatisfaction with CRISTAL, which may lead to its demise in the next several years. One reason is that, because of its position as a fund of last resort, CRISTAL is not actively involved during the cleanup itself and receives little public relations credit for the compensation it provides. The cost to oil companies is no different with CRISTAL than it would be with a widely adopted FUND, since both are supported by similar levies on oil receipts. However, oil companies in FUND member-countries must make two separate payments each year--one to CRISTAL and one to FUND--and this is perceived as onerous. Finally, the oil companies may believe that higher shipowner limits can best be achieved through the inter-governmental processes under CLC and FUND, rather than under the voluntary agreements.

CRISTAL's members have expressed their general feeling that CRISTAL's role of providing interim coverage pending the entry into force of the international conventions has run its maximum course. In the absence of new amended conventions being agreed to in 1984 (see Appendix C), CRISTAL's continuance is in grave doubt. If revisions to the conventions are adopted at the planned 1984 diplomatic conference, CRISTAL might fill a similar interim role with respect to the new instruments. However, this role would likely be for a short, stipulated period of time, e.g., as little as two to three years.

CRISTAL's impermanence is thus clear. TOVALOP is much more likely to remain in force as long as CLC is not adopted on a worldwide basis. TOVALOP is essentially a voluntary system to ensure that vessel owners carry P&I insurance. Since owners must have similar coverage in order to trade in CLC countries, there is little resistance to continuing TOVALOP.

3. Compensation Decisions

The oil-cargo-financed supplementary systems--FUND and CRISTAL--differ in the method of reaching compensation decisions. Under FUND, a group of nine government officials approves large claim settlements. This group can take a broad view of the situation without being unduly influenced by the problem of obtaining the contributions to pay for it. The IOPC Fund has generally paid compensation even in cases where the possibility of breaking the shipowner's limitation has not been finally settled. The payment to France recently agreed in the TANIO case (see Appendix D) is an example. However, the Fund generally investigates the possibility of breaking the owner's limitation. The Fund also looks carefully at the reasonableness of claims submitted before agreeing to pay them. Often the Fund agrees with the P&I Club to pay part of the expense of a spill expert to monitor the measures taken during a spill. This was the case with the 1982 ONDINA spill incident. In the ANTONIO GRAMSCI case, the IOPC Fund negotiated the claim settlement with the Swedish government and obtained some reductions.

The CRISTAL Board of Directors, on the other hand, knows that the compensation payments it approves must be funded directly from its member companies. There was therefore serious discussion within CRISTAL as to whether or not to reimburse the P&I Clubs some $26.5 million as part of the settlement in the PRINCESS ANNE MARIE case in Cuba. Because CRISTAL is a fund of last recourse, it does not become involved in the particulars of the spill as it occurs, and the damaged parties thus have no assurance that CRISTAL will accept the claims presented.

B. LIMITATION OF LIABILITY

The CLC Convention establishes legally binding limitations on the liability of a shipowner in countries that have adhered to the instrument. In non-CLC countries, TOVALOP may be offered but does not constitute any legal limit to the owner's liability. This distinction has been important in practice.

1. CLC Countries

In countries that have ratified the CLC Convention, there is a clear limitation to the shipowner's liability. This is the case, for instance, in the ONDINA incident in Hamburg. In this incident, 200 to 400 tons of heavy crude oil were inadvertently pumped into the harbor, causing extensive fouling of the sea-walls. The liability provisions of CLC clearly provide that the tanker owner is liable up to the limitation amount, and the P&I Club promptly established the limitation fund in the amount of DM 10.325 million (approximately $4 million). In addition, the P&I Club paid $9.7 million in cleanup costs, partly because of the certainty that amounts above the owner's limit would be recoverable from the IOPC Fund since West Germany has ratified both conventions.

2. Non-CLC Countries

There have been several spills in non-CLC countries that have posed complicated problems regarding the shipowner's right to limit his liability. For instance, in the case of the PRINCESS ANNE MARIE, which grounded in Cuba and caused pollution damage particularly to lobster fishing grounds, Cuba had no limitation in its national statutes and is not a member of CLC. Cuba therefore claimed unlimited liability and demanded $65 million in settlement. Following negotiations, a payment of $30 million was made for oil pollution and the impounded vessel was released. The bulk of the money was reimbursed to the P&I Club by CRISTAL. But had the cargo not been a CRISTAL cargo, the owner would have been faced with a liability much higher than that contemplated under CLC.

The INDEPENDENTA exploded and sank in the Bosporus in 1979 after being struck by a Greek cargo ship. Turkey has no laws on limitation of liability and is not a CLC member, so there has been no financial offer or settlement made by the P&I Club. Claims in the amount of $437 million were originally filed by the Turkish government, but nothing has been paid so far.

In the United States, there is a possible disincentive to the owner or his P&I Club to take prompt cleanup action, which might be remedied if the U.S. adopted CLC. This is for two reasons. First, the owner cannot recover his own cleanup costs from the FWPCA limitation fund, as he could under CLC. Thus, if an owner begins a cleanup and then decides that the total cost will likely exceed $150 per GRT (the FWPCA limit), he remains liable to the Government for the full limitation amount but will not be able to recover his own expenses. Second, once an owner

begins a cleanup, he may be unable to end his involvement and turn over the responsibility to the Coast Guard because of the risk that he might incur liability for any subsequent problems in the cleanup. Because of these risks, owners and the P&I Clubs are sometimes reluctant to promptly undertake oil spill cleanup operations in the United States.

3. CLC Member/Nonmember Cases

There are also particularly complex questions regarding limitation of liability in cases involving CLC member and nonmember nations. In the case of the AMOCO CADIZ spill off Brittany in 1978, France was a member of CLC and the convention was in force at the time. In a French court, or indeed in any CLC-member nation court, the shipowner's liability would have been clearly limited under CLC, and there would have been no liability for the agents of the owner. (The potential liability of the owner's parent company, also at issue in the AMOCO CADIZ case, would not be resolved under CLC wording as it stands at present.) This case raises the limitation question, since the suits brought in the United States seek damages far beyond CLC levels. If the owner can limit his liability under the Limitation of Liability Act, he will be liable only for $800,000, compared with claims of $2.2 billion.

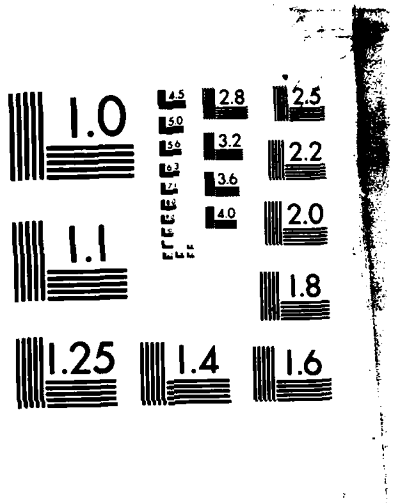
In the case of the BOEHLEN oil spill off France in 1976, limitation of liability was not established under CLC, even though France was a member, because the vessel was registered in East Germany, a nonmember of CLC. The P&I Club offered the 1957 Limitation Convention amount plus TOVALOP, but this was not accepted by the French Government and the matter is still before a French court. No limitation fund is required under the 1957 Convention, and none has been established. Limitation of liability is an important issue in this case because the limit under the 1957 Convention is only about $1 million, while the authorities spent at least $30 million in pumping out oil remaining in the wreck and incurred other costs. FUND was not in effect at the time of the incident.

C. PRACTICAL POSSIBILITY OF DENYING LIMITATION

The practical possibility of denying the tanker owner's right to limitation depends upon judicial interpretation in each country. Under CLC, the standard is that the shipowner can limit his liability unless the incident occurred "as a result of the

AD-A133 111 COST-BENEFIT ANALYSIS OF POSSIBLE US ADHERENCE TO TWO INTERNATIONAL CONVE..(U) TEMPLE BARKER AND SLOANE INC LEXINGTON MA 30 JUN 83 USCG-WER-83-1 DTCG23-82-C-5984 2/4

UNCLASSIFIED F/G 6/6 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

actual fault or privity of the owner." In practice, the interpretation of this standard may vary from country to country. In the United States, the standards embodied in the FWPCA and the LLA are similar to that of CLC, but the courts in interpreting these laws have on occasion found it possible to deny the owner's right to limit liability.

1. CLC Nations

If actual fault or privity can be proven, the shipowner is denied the right to limit his liability. Litigation is less common in Europe than in the United States, and no cases involving the CLC definition have yet been decided. In the United Kingdom, court findings suggest that the establishment of the owner's fault is interpreted narrowly and is hard to prove. The owner personally must be at fault, or in a company, the alter ego of the company must be involved, someone who ". . . is really the directing mind and will of the corporation, the very ego and centre of the personality of the corporation . . ." (Asiatic Petroleum Company versus Lennards Carrying Co. Ltd. (1915) A.C. 705). In a more recent case, the judge cast doubt on whether the head of the traffic department could be considered the "alter ego" of the company (Tesco versus Nattress (1973) A.C. 153, p. 200).

In France, a broader interpretation may be taken. The concept of "personal fault" in French law is considerably wider than the "actual fault or privity" in English law. The IOPC Fund is presently seeking to deny owner's limitation in French courts in the TANIO incident, in which a Madagascar-registered tanker fractured and spilled oil off Brittany in 1980. The basis for this action would be the vessel's unseaworthiness due to excessively corroded hull plating, which was not adequately repaired, thus leading to hull fracture during a storm. The Fund contends that this unseaworthiness is the personal fault of the owners. The court's finding in this case will shed interesting light on the interpretation of CLC provisions in France.

In several Japanese cases, the Fund has investigated the possibility of denying owner's limitation, but has found the likelihood of succeeding to be low in the particular cases. In the FUKUTOKU MARU NO. 8 case (1982), the vessel was navigating at night without exhibiting navigating lights and was thus 100 percent to blame for the collision and resulting oil spill. However, the lawyer retained by the Fund advised that the incident did not occur as a result of the actual fault or privity of the owner of the FUKUTOKU MARU NO. 8 because navigation at night without any navigation lights is beyond the control of the shipowner, provided he employs a qualified master and crew and the lights are technically in order.

A similar Japanese case involved the HOSEI MARU collision in 1980. The Fund believed that grounds might exist to deny the owner's right to limit liability under CLC, because (1) the collision might have been caused by the failure of the HOSEI MARU's boatswain to comply with navigation rules because he was not sufficiently qualified, and (2) the HOSEI MARU carried only five seamen on board to keep watch instead of six seamen as required under the Japanese Seamen's Law. However, an independent Japanese lawyer employed by the Fund to investigate these questions found that there was insufficient evidence to prove that the collision had occurred as a result of the owner's personal fault or privity. He concluded that the boatswain's experience at sea did indeed permit the Master, within the Japanese Seamen's Law, to assign the boatswain as a responsible watchman to be included in the ratings.

2. United States

In the United States, while the terms used are similar to those under CLC, much has depended upon the courts' interpretation. The two most relevant federal statutes concerning the shipowner's ability to limit his liability are the Limitation of Liability Act of 1851 (LLA) and the Federal Water Pollution Control Act Amendments (FWPCA), as discussed in Chapter I and Appendix B. Limitation can be denied under the LLA in cases involving the owner's "privity or knowledge." These terms have been described as "devoid of meaning . . . empty containers into which courts are free to pour whatever content they will." In general, the terms "privity or knowledge," very similar to those used under CLC, have been broadly interpreted in the United States.

The owner's right to limitation under the FWPCA can be denied in cases involving "willful negligence or willful misconduct within the privity or knowledge of the owner." This formulation has generally been interpreted as more protective of the shipowner--requiring a finding of willful negligence against him --than the LLA. The LLA requires only proof of simple negligence to break the limitations.

There is often an incentive to attempt to break the low limits of liability imposed under United States law. Cleanup costs are limited to the levels stated in the FWPCA, and government efforts to turn aside the FWPCA limits and recover higher costs under common law have failed on several occasions, including in the NEPCO 140 case (see Appendix A). Third-party damages fall under the LLA, which limits liability to the potentially low value of the vessel and pending freight after the accident.

The case of the tug OCEAN PRINCE illustrates a broad interpretation by a United States court in successfully breaking the owner's liability limits. This incident occurred in 1973, when the OCEAN PRINCE caused a barge that it was pushing to ground and spill oil in the Hudson River. Under the FWPCA, the government had to show that the discharge was the result of willful negligence or willful misconduct within the privity and knowledge of the owner. The Court of Appeals found that a combination of factors did, in fact, permit this finding and the breaking of the owner's right to limitation. The factors were, first, that the tug owner's dispatcher failed to designate which of two qualified pilots posted to the tug was to be Master. The pilot lacking Hudson River experience was at the helm when the barge stranded. Second, the dispatcher failed to advise the more experienced pilot of the other's lack of familiarity with the river. Third, the deckhand on watch was below getting coffee at the time of the incident, and this practice of sending the deckhand below for coffee was known to a vice president of the tug-owning company.

These facts were enough to convince the court that there was willful misconduct within the privity of the owner, and to deny the owner the right to limit his liability. The Appeals Court defined the FWPCA standard as "an act, [or omission] intentionally done, with knowledge that the performance will probably result in injury, or done in such a way as to allow an inference of a reckless disregard of the probable consequences." (Complaint of Tug Ocean Prince, Inc., 584 F.2d 1151, 1978 AMC 1786 (2d Cir. 1978).

The owner's liability limit has also been broken in several cases under the LLA. In the ZOE COLOCOTRONI incident, the Court found gross negligence on the basis of a deliberate discharge of oil, an unseaworthy vessel lacking a competent crew, radar, charts, and a functioning depth finder, and substantial evidence of privity. It was held that the deplorable condition of the vessel was clearly within the knowledge of her owners. In the EDGAR M. QUEENY case, the Court found "privity and knowledge" because a defective valve prevented the QUEENY's astern turbine from developing sufficient power to prevent a collision and because this defect was known to the owner. The condition of the steering gear in the AMOCO CADIZ may be of key importance in determining the owner's right to limitation in that case.

On the other hand, the owner's right to limitation has been denied in other cases in United States courts. In the Steuart Transportation case, the court refused to limit liability under the LLA. An oil spill resulted from a vessel's deteriorated

equipment (one of the deck closures), and this condition would have been disclosed by a reasonably careful inspection. The court held that the failure of Steuart's management to discover and correct the defect constituted negligence within the privity or knowledge of the owner. However, since this failure was not deemed "in any sense willful," the court allowed the owner to limit his liability for federal cleanup costs under the FWPCA. (Steuart Transportation Co. vs. Allied Towing Corp., 596 F.2d 609 (4th Cir. 1979).)

Interpretation by United States courts of the owner's fault or privity would not be reconciled simply by adherence to the terms of the CLC and FUND Conventions. However, part of the courts' consideration in deciding whether to deny the owner's limitation may be the knowledge that the existing legal limits are too low to permit adequate compensation to be paid. Access to the IOPC Fund might thus provide both greater certainty for the tanker owner and his P&I Club, less litigation, and a higher likelihood of recovery for spill cleanup costs and third-party damages.

D. JURISDICTION

Under CLC, claims must be settled in the courts of the nation in which damages were caused and judgments must be recognized by other member countries. Non-CLC member nations are not bound by any such clear guidelines, and both claimants and defendants can seek jurisdiction in courts that suit them best. This kind of "forum shopping" can introduce an additional element of uncertainty and delay into claims settlements.

The AMOCO CADIZ incident, in which nearly 200,000 tons of crude oil were spilled off the coast of Brittany in 1978, is perhaps the premier case involving jurisdiction issues. The French initially asked that the CLC limitation fund be established in France. This was done; the P&I Club paid $16.735 million in cash, which is presently on deposit in Brittany. The vessel owners (a subsidiary of Standard Oil of Indiana) initially sought to limit liability to the value of the vessel under United States law (LLA). Subsequently, AMOCO argued that the case should be brought in French courts, in accordance with CLC, which France had ratified. Finally, AMOCO acceded to the case being brought in a United States court, primarily because they had become convinced that they might get a better hearing in the United States.

Total claims in several class action suits by French citizens are $2.2 billion in the AMOCO CADIZ case. The claims have all been consolidated in the federal district court in Chicago, and the right of the owners to limit their liability is presently being determined. A finding of negligence within owner's fault and privity must be made in order to break the LLA limit, which is a very low $800,000 in this case. The P&I Club is seeking limitation for the Liberian subsidiary shipowner. However, there may not be any limitation for the Bermudian ship operating subsidiary or for the AMOCO parent. Once the present liability trial has reached a decision, a damage trial will be conducted. Legal costs to date are estimated at $40 million or more.

In terms of jurisdiction, if the court finds that the owner's liability is limited under LLA, the claimants might take the case back to France, while continuing to pursue the other defendents in U.S. court. If damages of at least $30 million could be proved in France, claimants could obtain the $16 million CLC limitation fund amount and a $14 million payment from CRISTAL (whose maximum, from all sources, was $30 million at the time of the incident), since a CRISTAL cargo was involved.

Future incidents may also lead to "forum shopping" by spill victims in cases such as the AMOCO CADIZ, where United States-owned (directly or indirectly) vessels are involved in spills in CLC-member waters. The jurisdiction problem is related to the low limit under LLA, the courts sometimes broad interpretation of the grounds for breaking limitation, and the lack of international recognition of jurisdiction and court findings as long as the United States has not adhered to CLC. It is also complicated by the fact that there are no clear rules governing the liability of parties other than the owner, such as United States parent companies of foreign-flag tanker operators.

III. THE REGIMES IN PRACTICE: INSURANCE ASPECTS

This chapter describes the principal insurance aspects of the public and private regimes, as they operate in practice. The characteristics of the shipowners' liability coverage with P&I Clubs--which is identical under CLC or TOVALOP--are described in the first section, because the practical workings of the P&I Clubs and the shipowner/P&I response to oil spills is essential to an understanding of oil pollution liability matters. The second section discusses the handling of claims during and after a spill under the FUND and CRISTAL schemes. In the third section, the differences in provisions between the public and private regimes that have had the greatest impact in practice are assessed.

A. SHIPOWNERS' INSURANCE IN PRACTICE

Shipowners generally insure against third-party liabilities and certain contractual liabilities associated with ship operation through P&I Clubs. These clubs, or Protection and Indemnity Associations, were formed beginning in the 1850s in London as mutual clubs of shipowners. The P&I Clubs agreed to share each other's liabilities on a nonprofit basis, writing cover initially for one-fourth collision liability (which was not covered by hull underwriters) and liability for death and personal injury. This cover was called Protection Insurance. In the 1870s, the clubs began to insure liability for loss of or damage to cargo, termed Indemnity Insurance. Thereafter, the clubs became known as Protection and Indemnity Clubs.

1. Structure

The insurance offered by P&I Clubs has been extended to cover third-party risks that have been imposed on shipowners by new legislation and for which no insurance was offered by the market. Specifically, P&I Clubs insure against cleanup costs and damage claims resulting from oil spills, and cover wreck removal costs, in addition to the traditional personal injury, collision, and cargo-loss claims. The distribution of claims by major type of insurance for a typical P&I Club (Exhibit III-1) indicates that oil pollution liability coverage represents a modest share --in this case about 7 percent--of a P&I Club's business. Only one club, the International Tanker Insurance Association (ITIA), specializes exclusively in oil pollution insurance; the others

offer pollution cover as part of their overall coverage. ITIA is unique in that it was established by the major oil companies to provide oil pollution coverage, which at the time of its establishment was not easily obtainable elsewhere.

The members of a P&I Club are the shipowners who insure with it. Each club is controlled by a Board of Directors representing the shipowners (generally including both the tanker-operating subsidiaries of the major oil companies and the independent owners of liquid and dry cargo ships). Management of a club is undertaken either by managers directly employed by the club, or on a contract basis by a firm of managers often organized as a partnership.

The 15 largest P&I Clubs have joined together as the International Group of P&I Clubs for the purpose of pooling and reinsuring their liabilities (see Exhibit III-2 for a listing of clubs). Each club retains the first layer of losses, pools the next layer among the clubs, and the Group of Clubs reinsures the excess with the market. At the present time, each club's "retention" (the first layer) is $900,000. The excess of each claim over $900,000 up to $8 million is shared by the clubs under the Pooling Agreement. The excess of each claim over $8 million is reinsured on the world insurance market, providing coverage of oil pollution claims up to $300 million and other claims up to $650 million. Claims for non-oil pollution liability exceeding $650 million would be shared under the Pooling Agreement since the P&I Clubs offer unlimited coverage for these risks. However, the clubs currently limit their cover for oil pollution risks to $300 million in view of the perceived risk of high-cost pollution incidents.

2. The Mutual Call System

The P&I Clubs are mutual clubs whose costs of claims settlement are not known in advance. The club members' premium payment system is therefore organized into an initial payment (Advance Call) at the beginning of the year based on projected costs, and Supplementary Calls from time to time until the policy year is completely closed out. The Advance Call presently ranges from 75 to 100 percent of the member's estimated total cost.

The method of determining insurance rates for shipowner members varies from club to club, but is essentially based on a judgment as to the past experience and future outlook for that owner's fleet. The clubs base the rate per ton mainly on their overall experience with the owner, rather than on an analysis of the specific types of claims made by the owner. Thus, the cost

of oil pollution coverage for a given owner is probably related more to the owner's general loss record than to the number of spill incidents sustained. The P&I Club will, however, try to raise a company's rates following a high pay-out so that the club recovers its outlay from the owner over a period of years. There is generally little rate competition between clubs, but a club must balance its objective of recovering on a fair basis from an owner with the possibility of losing a member if rates are too high. The club also has the option not to renew membership of companies that continually present a high level of claims.

3. Evolution of Insurance Capacity

The P&I Clubs reinsure the highest layer of risk on the world market, so it is the overall capacity of this market that determines how much oil pollution damage coverage can be obtained commercially. At the time of the CLC Conference in 1969, the P&I Clubs stated that $10 million per incident was the maximum obtainable. Since then, the limit has been raised on several occasions. When the AMOCO CADIZ incident occurred in 1978, the limit was $50 million. Shortly afterward, in response to concerns of the oil companies and evolution in the insurance marketplace, the P&I cover for oil pollution was raised to $300 million--where it stands today. The capacity of the insurance market is variable, depending upon economic factors, such as interest rates, that determine the amount of money that firms and individuals are willing to commit to underwriting insurance. At present, substantial overcapacity exists in the market, and there is no doubt that higher shipowner liability limits could be accommodated. However, this might not hold true over time because of uncertainty concerning the interpretation of laws designed to limit the owner's liability and concerning the definition of pollution damage.

4. Settlement of P&I Claims

Quality of service in handling claims is a major aspect of the P&I insurance business. The clubs are organized to be able to respond promptly to an owner's needs throughout the world, under a variety of jurisdictions. They maintain networks of correspondents to assist the owner on the spot and handle any claims. The clubs also provide a "Letter of Undertaking" or a bond in order to secure the release of a vessel that has been arrested after causing damage to a third party. In the head office (many P&I Clubs are operated from London, though there are several other clubs, including Scandinavian clubs, an American club, and a Japanese club), the club is organized either under

the "syndicate" system, which is client-based, or under the "departmental" system, which specializes in a given type of claim. The P&I Clubs try to serve their members efficiently, and a single club will handle some 10,000 to 30,000 claims per year.

5. P&I Club Handling of Oil Pollution Cases

The P&I Clubs are generally directly involved in the cleanup phase of oil pollution cases. In the United States, the vessel owner must make a quick decision as to whether or not he will take responsibility for the cleanup effort. Owners have accepted responsibility and committed their resources in the vast majority of U.S. oil spills involving seagoing vessels or barges.

As soon as a spill occurs, the master contacts the U.S. Coast Guard (which serves as federal On-Scene Coordinator during the cleanup), the vessel owner or agent, and the P&I Club's local representative. The Clubs retain spill response coordinators who are called in at short notice to direct the cleanup effort on the owner's behalf. The independent coordinator engages a cleanup contractor, if this has not yet been done, and appoints a surveyor to proceeed to the spill site, conduct slick surveillance studies, and generally look into the circumstances surrounding the spill occurrence. The Club's coordinator works closely with the cleanup contractor, the surveyor, the terminal operators or property owners where cleanup is taking place, the U.S. Coast Guard representative, and other authorities, and keeps the P&I Club and owners informed.

The Club's coordinator handles a variety of tasks, depending upon the size and location of the spill and the product involved. The following steps are typical in the event of a spill:

- Mobilization, spill containment, and countermeasures.
- Cleanup and oil disposal.
- Restoration of area and demobilization of contractors.
- Full investigation regarding series of circumstances surrounding spill in question. Obtain all statements, surveys, log entries, photographs, etc.
- Final meeting or conference on scene with U.S. authorities to obtain confirmation that spill was cleaned up to their satisfaction.

- Survey and check the area, small craft, and yachts in the event third-party claims are presented.

The Club's coordinator also handles the payment of cleanup bills and third-party claims. For major spills, the P&I Club often forwards periodic payments to the cleanup contractor while the cleanup is in progress. The coordinator reviews the bills on a weekly basis and approves an amount on a percentage basis until the cleanup is complete. Thereafter, a full audit of all charges submitted is made and the final payment is forwarded to the contractor. In the case of third-party claims, the services of the Club's coordinator/adjuster are employed to review all claims submitted and dispose of them subject to the terms and conditions of the policy. The spill coordinator also recommends to the P&I Club what expenses can properly be considered oil pollution prevention versus costs incurred for cargo salvage or wreck removal.

There have been numerous U.S. cases where the shipowner has declined the cleanup responsibility, and the U.S. Coast Guard On-Scene Coordinator has taken charge. The NEPCO 140 and CONCHO spills are examples. In these cases, the Club's coordinator plays a monitoring role, in case there may be a claim against the vessel at a later date.

B. SUPPLEMENTARY SCHEMES IN PRACTICE

There are differences in the methods utilized by FUND and CRISTAL in reacting to spills and settling claims that are based on the terms of the two regimes. The major differences relate to the stance taken by the two regimes during the spill and subsequent claims settlement, to the financial flexibility available under the two systems, and to the claims settlement response times of the two organizations. The variety of claims handled and administrative expenses of the two supplementary compensation regimes have been similar.

1. Comparison of Role During Spill and Settlement

FUND and CRISTAL adopt different roles in an oil pollution incident, reflecting their different charters. Because CRISTAL provides compensation only on a "last resort" basis, it is not actively involved in decision making during a spill or in litigation afterwards. It adopts wait-and-see posture, and often

reviews claims years after the event and after all other compensation payments have been made. The IOPC Fund, on the other hand, assumes it will be involved in any major spill in a FUND nation. Fund staff therefore consult closely with the authorities in charge of the spill cleanup, in order to clarify as far as possible beforehand what expenses the Fund would accept later on, and the areas in which it has reservations. The Fund has been involved in very few suits involving its liability under its articles or the possibility of breaking the owner's right to limitation. The TARPENBEK case in the U.K. involving pre-spill preventive measures is the best example. CRISTAL has not been involved in any lawsuits.

There are several good examples of the IOPC Fund's early involvement in spill situations. The involvement is generally aimed at resolving as early as possible any potential problems that might arise regarding the Fund's acceptance of claims. Fund staff do not attempt to take any active role or responsibility during a cleanup. In the case of the 1980 TANIO spill, which was likely to exceed the owner's liability and thus come under FUND provisions, the Fund Director was consulted by the French government prior to authorizing an expensive operation to pump the remaining oil from the sunken vessel, and the Director put his agreement in principle with these steps in writing. In the ONDINA case in Hamburg (1982), the Director flew to Germany to ensure close coordination with the authorities.

CRISTAL, by contrast, has little direct involvement during a spill. The Institute is generally informed of incidents, but takes no pro-active steps. For instance, in the PRINCESS ANNE MARIE case, the P&I Club was faced with a critical decision: whether to settle with Cuba for $30 million, or to contest the $65 million claim in a Cuban court. The shipowner's limitation, including rollback, was about $3.5 million. Since it was a CRISTAL cargo, it was clear that CRISTAL could potentially pay a very large share of the claim. The P&I Club consulted with CRISTAL, but the reply by CRISTAL'S Board was essentially that the Club should use its best judgment. Thus, CRISTAL did not take an active role even in a case that eventually cost the CRISTAL parties $26.5 million.

FUND and CRISTAL also adopt different stances during the settlement phase when legal complications arise. FUND is being sued by the P&I Club in the TARPENBEK case, where there is some dispute over the exact nature of preventive measures covered by FUND. In the FURENAS case, FUND has retained lawyers to determine how best to recover a small amount of money from the Swedish hull insurers of the colliding vessel. In the very large TANIO

case, FUND is attempting to break the owner's right to liability limitation under CLC, and has also sued various third parties based on alleged negligence. CRISTAL, however, waits until all the legal determinations have been made and settlements reached. It then reaches a decision as to what it will pay out.

2. Financial Flexibility of the Systems

A closely related area of difference lies in the financial flexibility taken by FUND and CRISTAL in response to claims. The FUND Director has authority to settle claims up to about $1.8 million per incident. He can also make interim payments to claimants, such as fishermen who may have suffered direct economic losses, even before the limitation fund has been established. FUND has generally paid before being certain as to whether the owner could limit liability. For instance, in the TANIO case, payment of the French Government claims is now being arranged, even though litigation potentially affecting FUND's liability is proceeding. CRISTAL has made a payment to fishermen in the ELENI V case while the major claims are unresolved, but in general it does not respond flexibly in a financial sense because it is a system of final recourse.

3. Claims Settlement Response Times

Claims settlements, for the reasons noted above, are quicker under FUND than under CRISTAL. The mean time from incident to settlement is 7.8 months for FUND, and 28.9 months for CRISTAL (see Exhibit III-3). This is largely because final claims cannot be submitted to CRISTAL until it is known how much will be recovered from other sources. Even once the final claim has been submitted, FUND acts somewhat more quickly than CRISTAL: 1.5 months to settlement versus 6.2 months. As of end-1982, FUND had seven cases outstanding, of which four occurred more than two years ago. CRISTAL had ten cases outstanding, of which nine were over two years old.

4. Claims and Administrative Experience of FUND and CRISTAL

The IOPC Fund commenced operations in February 1979, and handled an average of four cases per year (14 total) in the period to September 1982. Six cases have been settled, involving total outlay by the FUND of about $25 million (see Exhibit III-4). Of these six cases, four occurred in Japan and two in the Baltic. All but one case involved FUND payments of $1 million or less.

The eight additional cases outstanding (see Exhibit III-6) consist of five European and three Japanese spills. Several of these cases involve potentially large amounts. In the TANIO case off the coast of France, FUND has recently agreed to make a $45 million payment toward settlement of the French claims. The ONDINA case in Germany is likely to require a $5 million payment from FUND. The TARPENBEK case in England could involve FUND liability of $2 to $3 million, if the courts find FUND liable for preventive measures in a pure-threat case.

CRISTAL began operations in 1971, and has averaged just over two cases per year since then (total of 26 cases). Eighteen cases have been settled, of which nearly half occurred in Japan and four occurred in the United States (Exhibit III-5). Of these eighteen cases, only two involved CRISTAL payments of over $1.5 million: the CHEVRON HAWAII in Texas ($4.2 million) and the PRINCESS ANNE MARIE in Cuba ($26 million). An additional eight cases potentially involving CRISTAL are outstanding, and several could require substantial payments by CRISTAL (Exhibit III-7). For instance, the AMOCO CADIZ case (France, 1978) could require CRISTAL to pay nearly $20 million in damage claims and rollback to the shipowner, unless the courts break the owner's limitation or find some other party liable. The ANTONIO GRAMSCI, BETELGEUSE, ELENI V, IRENES SERENADE, and TARPENBEK cases all involve potentially large liabilities, but the actual amount to be paid by CRISTAL will depend on how much of the claim can be recovered from other sources.

Administratively, both the IOPC Fund and the CRISTAL operation are conducted with very small staffs and modest budgets. The administrative budget of the IOPC Fund has ranged from £170,000 to £220,000 during the 1980-1982 period (see Exhibit III-8). CRISTAL's budget has been similar. These costs are kept low by purchasing the services required in connection with individual spills. This is a useful approach, since the type and volume of work involved fluctuates considerably over time. Typically, the IOPC Fund retains a surveyor jointly with the P&I Club in cases that may involve the FUND. Lawyers are often retained by the Fund to investigate the possibility of breaking owner's limitation in a given case. Claims adjustment is also performed under contract by private firms. The technical staff of the Federation which administers TOVALOP is also used by the Fund on occasion.

C. DIFFERENCES IN PROVISIONS

In practice, there are several key differences in the provisions of the public and private regimes. Aspects of particular

interest include the treatment of ballast voyages, prespill preventive measures, bareboat charterers, geographical coverage, exchange rate fluctuations, and definitions of pollution damage and oil types covered.

1. Ballast Voyages

TOVALOP covers bunker spills during ballast voyages; CLC does not. This situation has not occurred often, and in general, the resulting claims have not been very large, but it can be an important distinction in a given spill. The most dramatic case involved the OLYMPIC BRAVERY, a VLCC which ran aground on the French coast, in ballast, shortly after delivery. The bunker spill amounted to 1,250 tons and resulted in claims of $725,000 paid by TOVALOP. CLC would not cover such a case. Two other cases are the VENPET and VENOIL collision off South Africa in 1977, in which the VENPET was in ballast and spilled bunker fuel; and the ESSO BERNICIA (1978) which spilled bunkers in Sullom Voe, United Kingdom.

2. Prespill Preventive Measures

The industry agreements (TOVALOP and CRISTAL) specifically include oil spill threat removal measures, whether or not pollution subsequently occurs. But CLC and FUND are not entirely clear on this point, although the wording seems to indicate that only measures taken after a spill are covered:

> "Preventive measures" means any reasonable measures taken by any person after an incident has occurred to prevent or minimize pollution damage."
>
> (CLC Convention, 1969, Article I.)

The best-known case involving this feature of CLC and FUND is the TARPENBEK spill off the English coast in 1979. The FUND is presently being sued by the British Government, the shipowner, and others on the grounds that the FUND does cover pre-spill expenses where there is an imminent threat of spill. The FUND maintains that there is no liability because there was no spill of persistent oil prior to the preventive measures being taken. The litigation has not yet been settled.

This distinction could have important consequences in a case involving significant spill risk, but in which the oil did not in fact spill.

3. Bareboat Charterers

Under TOVALOP, the first layer of liability is borne by the shipowner or the bareboat charterer. CLC applies only to the owner, leaving the status of the bareboat charterer in limbo.

The distinction is important because in many cases oil tankers are "owned" by banks or other financial institutions and leased or "bareboat chartered" to the traditional ship operator who exercises possession and control of the tanker. The narrower treatment under CLC does not allow the bareboat charterer to limit his liability, but also makes the "actual fault or privity" test harder, since it applies to the owner rather than to the bareboat charterer. Cases in which this distinction may have importance include the TANIO incident and the AMOCO CADIZ. Both of these cases occurred off the coast of France, but the TANIO litigation is proceeding in a French court under CLC while the AMOCO CADIZ case is being tried in the U.S. which is not a party to CLC.

4. Geographical Coverage

TOVALOP and CRISTAL apply to vessels and cargoes entered in the respective agreements, whereas CLC and FUND are geographically defined. This distinction has had important effects in practice. For instance, the BURMAH AGATE spill in Texas which has resulted in claims of about $8 to $10 million was not covered by CRISTAL because the cargo had been sold to a non-CRISTAL party prior to the spill. Had the U.S. been a member of CLC and FUND, full coverage would have been available.

The distinction also arises in multi-country spills. In the ANTONIO GRAMSCI case, only Sweden received compensation from the FUND because it was a member, while the USSR and Finland, which also suffered pollution damage, were not members. The latter countries may, however, collect from CRISTAL, although no CRISTAL payments have yet been made.

5. Exchange Rate Fluctuations

Exchange rate variations cause the contributions and the liability and compensation limits under CLC and FUND to fluctuate in terms of a single currency such as the U.S. dollar. TOVALOP and CRISTAL, on the other hand, have fixed their limits in terms of dollars. The changing dollar value of CLC and FUND limits over the past several years are illustrated in Figure III-1. The

CLC/FUND maximum of 45 million SDRs was equivalent to $49 million at end-February 1983, but was equal to $60 million at end-June 1980. Thus, while the combined CLC/FUND maximum has always considerably exceeded the CRISTAL limit since the April 1979 increase of the FUND maximum from 30 million to 45 million SDRs, the dollar amount has varied by over $10 million.

At the present time, the dollar is considered to be quite strong relative to other currencies, and hence potential U.S. contributions to and compensation limits from FUND would be low in dollar terms. Over the next five years, the dollar/SDR exchange rate could well vary by 25 percent. However, it is more likely that the dollar will weaken relative to the SDR than vice versa.

Another difference concerns the exchange rates used to make payments for oil spill claims. In the case of FUND, claims in national currency are paid at the exchange rate prevailing when the payment is actually made. If a large payment is involved and is known in advance, the FUND may purchase the currency needed using a forward contract. Under CRISTAL, claims in national currency are settled at the exchange rate prevailing when the limitation fund was established.

6. Definitions: Pollution Damage and Oil Type

The definition of pollution damage, particularly concerning natural resources, has posed difficult problems. Under CLC, pollution damage is defined vaguely as "loss or damage caused . . . by . . . the escape or discharge of oil from the ship . . ." The USSR submitted a large claim to the Russian court in relation to the ANTONIO GRAMSCI incident, 97 percent of which was based on a theoretical calculation of the cost to restore polluted water to a clean condition. The FUND Assembly stated, in response to this incident, that pollution damage claims should be based on quantifiable losses which can be positively attributed to a particular incident.[1] A resolution was passed that claims to the IOPC Fund must not "be made on the basis of an abstract quantification of damage calculated in accordance with theoretical models." The GLOBE ASSIMI case, also involving a large Soviet claim, may raise similar issues.

[1]The IOPC Fund was indirectly affected because Sweden, which was a FUND member, also suffered damages from the spill. Because of the high Soviet claim, the Russian court awarded most of the CLC limitation fund to the USSR, leaving little for Sweden. The IOPC Fund therefore had to pay more to Sweden than it would have, had the USSR claim been smaller.

Under CRISTAL, pollution damage specifically "excludes any loss or damage which is remote, or speculative, or which does not result directly from such escape or discharge." Since CRISTAL has not yet settled with the USSR on the ANTONIO GRAMSCI incident, it is not yet known what interpretation may be adopted.

Oil types covered by the FUND convention posed such a definitional problem that a special non-technical guide to the nature and definition of persistent oil was produced to serve as a guideline. Several spill claims have been rejected by the FUND on the basis that they did not involve persistent oil. For instance, the VERA BERLINGIERI incident in Italy (1979) involved a cargo of gasoline and gasoil, which spilled and burned. Apparently, no claim was ever formally received by the FUND, but there was some question as to whether the cargo was "oil" as defined under the CLC. More recently, the tanker JUAN ANTONIO LAVALLEJA spilled 40,000 tons of LNG condensate into the harbor at Arzew, Algeria. An analysis of the cargo oil indicated that it could not be considered "persistent", and the IOPC Fund therefore did not accept liability for the pollution damage that might have been caused.

CRISTAL defines oil as "any persistent hydrocarbon mineral oil such as crude oil, heavy diesel oil or lubricating oil." There are no evident cases of definitional problems encountered by CRISTAL, but the potential exists, as it does for FUND.

Exhibit III-1

ANALYSIS OF TYPICAL P&I CLUB
CLAIMS BY NATURE OF CLAIM

(percent of total claims cost)

	Policy Year[1]					5-Year Average
	1976	1977	1978	1979	1980	
Vessel-Related Claims						
Oil Pollution	5.1	7.4	8.6	2.5	8.4	6.5
Damage to Fixed Objects	5.8	13.7	4.1	7.8	5.8	7.3
One-Fourth Collision	1.9	2.2	1.9	3.8	2.9	2.6
Damage Without Contact	0.6	1.6	1.3	1.5	1.1	1.3
Claims Under Tonnage Contract	0.2	0.4	0.1	0.2	1.0	0.4
Wreck Removal	0.7	1.5	14.1	0.5	0.4	3.9
Personnel-Related Claims						
Crew Injuries, Expenses	22.0	15.7	17.5	19.2	18.8	19.9
Stevedore Injuries	4.9	2.8	2.7	1.9	2.0	2.7
Other Injuries	0.5	1.4	1.6	2.3	2.6	1.8
Cargo-Related Claims						
General Cargo	24.1	26.2	17.0	22.8	20.8	21.8
Dry Bulk Cargo	13.9	10.5	14.6	17.7	21.9	14.6
Liquid Bulk Cargo	4.7	3.7	1.9	6.7	5.7	4.5
Refrigerated Cargo	2.2	2.0	1.9	2.8	2.7	2.3
General Average-Cargo	3.4	1.4	2.2	2.6	2.0	2.2
Other Claims	10.0	9.5	10.5	7.7	3.9	8.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1]Policy year ends on February 20th.

Source: TBS analysis of 1982 Annual Report of a major P&I Club.

Exhibit III-2

MAJOR P&I CLUBS

P&I Club and Name of Club Managers	Staff Location
Britania Steam Ship Insurance Association Limited Tindall, Riley & Co.*	London, England
London Steam-Ship Owners' Mutual Insurance Association, Ltd. A. Bilbrough & Co., Ltd.*	London, England
Newcastle Protection and Indemnity Association	London, England
North of England Protecting and Indemnity Association, Ltd.*	London, England
Oceanus Mutual Underwriting Association (Bermuda) Ltd. John Laing Management (Bermuda), Ltd.	London, England
Standard Steamship Owners' Protection and Indemnity Association, Ltd. Charles, Taylor & Co.*	London, England
Sunderland Steamship Protecting and Indemnity Association*	Sunderland, England
United Kingdom Mutual Steamship Assurance Association Thos. R. Miller & Son*	London, England
West of England Ship Owners' Mutual Protection and Indemnity Assoc. Managers directly employed by Club*	London, England
Liverpool and London Steamship Protection and Indemnity Association, Ltd.*	Liverpool, England
Assurance foreningen Gard (Gjensidig)*	Arendal, Norway
Assurance foreningen Skuld (Gjensidig)*	Oslo, Norway
Sveriges Angfartygs Assurans Forening*	Gothenburg, Sweden
Japan Ship Owners' Mutual Protection and Indemnity Association*	Tokyo, Japan
American Steamship Owners Mutual Protection and Indemnity Association Shipowner Claims Bureau	New York, USA

*Denotes members of International Group of P&I Clubs.

Source: International Group of P&I Clubs; TBS analysis.

Exhibit III-3

SPEED OF CLAIMS SETTLEMENT BY FUND AND CRISTAL
FOR ALL CLAIMS SETTLED AS OF LATE 1982

Vessel	Date of Incident	Date of Claim	Date of Settlement	Elapsed Time (months) Incident to Settlement	Claims to Settlement	Comments
CRISTAL						
William G. Walkeley	3/72	8/73	12/73	21	4	
Hiyoshi Maru No. 2	1/73	12/73	7/74	18	7	
Nissei Maru	5/73	12/76	4/77	47	4	Collision case. Division of responsibility not determined until 1976.
Nikko Maru	10/73	9/74	1/75	15	4	
Onward Enterprise	1/74	8/74	12/74	11	4	
Imperial Sarnia	4/74	4/75	12/75	20	8	
Nikko Maru	10/74	7/81	10/81	84	3	Collision case. Division of responsibility not determined until 1981.
Corinthos & Queenie	1/75	5/76	6/77	29	13	
Shell Barge No. 2	4/75	4-12/76	6/76, 6/77	26	2, 6	
Mitsui Maru No. 3	4/75	7/76	12/76	20	5	
Ota Maru No. 15	4/75	9/80	4/81	72	7	Collision case. Division of responsibility not determined until 1980.
Tsurumato Maru No. 3	2/76	9/79	12/79	46	3	Collision case. Delay in recovery from colliding vessel.
Ethel "H"	2/77	1/78	5/78	13	4	
Toyofuji Maru No. 2	9/77	1-2/78	6/78	9	4	
Eleni V	5/78	10/78	12/78	7	2	This is settlement to fishermen. Main oil spill claims still pending legal decisions.
Kurdistan	3/79	8/80	6/82	39	22	Delay due to long official inquiries.
Chevron Hawaii	9/79	7-9/80	3/81	18	6	
Pricess Anne Marie	1/80	5/81	3/82	26	10	
CRISTAL Average				28.9	6.2	
FUND						
Antonio Gramsci	2/79					
Claimant: Swedish Government		10/79	3/80	13	5	
Miya Maru No. 8	3/79					
Claimant: Fishermen, provisional		7/79	8/79	5	1	
Fishermen, final claim		10/79	10/79	7	0	
Other third parties		10/79	10/79	7	0	
MSA[1]		11/79	11/79	8	0	
Mebaruzaki Maru No. 5	12/79					
Claimant: third parties		12/80	1/81	13	1	
Showa Maru	1/80					
Claimant: Fishermen		5/80	5/80	4	0	
JMDPC[2]		6/80	6/80	5	0	
MSA[1]		8/80	8/80	7	0	
Furenas	6/80					
Claimant: Swedish boatowners		9/80	1/81	7	4	
Swedish government		10/80	3/81	9	5	
Danish boatowners		12/80	2/81	8	2	
Danish government		12/80	3/81	9	3	
Danish fishermen		12/80	2/81	8	2	
Danish local authorities		1/81	2/81	8	1	
Hosei Maru	8/80					
Claimant: MSA, JMPDC, and subcontractors		1/81	2/81	6	1	
Fishermen		4/81	4/81	8	0	
FUND Average				7.8	1.5	

[1]MSA is the Maritime Safety Agency, Japan (equivalent to Coast Guard).
[2]JMPDC is the Japanese Maritime Disaster Prevention Center.

Source: TBS analysis of data provided by the Oil Companies Institute for Marine Pollution Compensation Limited (claims settled as of November 15, 1982) and the IOPC Fund (claims settled as of December 1982).

Exhibit III-4

FUND CASES SETTLED AS OF SEPTEMBER 1982

(exchange rates at approximate payment date)

Vessel	Date of Incident	Location	Costs (US$)			Payments (US$)					Comments
			Cleanup Costs	Damage Claims	Total Costs	Ship Owner Net Limit (CLC)	Fund Cleanup/Damages Net Payment	Fund Rollback	Fund Total	Other	
Antonio Gramsci	Feb. 1979	Ventspils, USSR	6,740,000	90,760,000	97,500,000	3,700,000	21,750,000	0	21,750,000		Not eligible for FUND rollback
Miya Maru No. 8	March 1979	Inland Sea, Japan	578,000	167,000	745,000	119,000	558,000	39,000	597,000	29,000	FUND recovered $29,000 from colliding vessel
Mebaruzaki Maru No. 5	Dec. 1979	Mebaruzaki, Japan	40,000	14,000	54,000	3,000	50,000	1,000	51,000	0	
Showa Maru	Jan. 1980	Naruto Straits, Japan	48,000	429,000	477,000	26,000	399,000	9,000	408,000	43,000	FUND recovered $43,000 from colliding vessel
Furenas	June 1980	Oresund, Sweden	891,000	9,000	900,000	134,000	766,000	0	766,000	0	Rollback of $21,000 to owner will be paid by FUND shortly. Colliding ship owes FUND.
Hosei Maru	August 1980	Honshu, Japan	924,000	285,000	1,209,000	174,000	1,035,000	0	1,035,000	0	Rollback to owner of $43,000 will be paid by FUND.

Source: IOPC Fund Annual Reports for 1978-79, 1980, 1981; IOPC Fund documents FUND/EXC.7/2 of July 19, 1982 and FUND/EXC.7/2 Add.1 dated September 9, 1982; and TBS analysis.

Exhibit III-5

CRISTAL CASES SETTLED AS OF NOVEMBER 1982

(in thousands of dollars, at average exchange rate applied by CRISTAL)

Name of Vessel	Date of Incident	Agreed Claims	BREAKDOWN OF CLAIM					RECOVERY FROM				Total Recovery
			Spill Cleanup	Fisherman's Compensation	Wreck Removal	Preventive Measures	Survey & Legal Fees	Colliding Vessel	Other Sources	Shipowner	CRISTAL	
William G. Walkeley	1972 Mar.	6	6						1	3	2	6
Hiyoshi Maru No. 2	1973 Jan.	939	473	465			1			657	282	939
Nissei Maru	1973 May	1,711	1,184		450		77	1,140		107	464	1,711
Nikko Maru	1973 Oct.	1,222	690	521			10			594	628	1,222
Onward Enterprise	1974 Jan.	32	32							23	9	32
Imperial Sarnia	1974 Apr.	1,944	1,812			132				648	1,296	1,944
Nikko Maru	1974 Oct.	1,333	466	853			13	666	5	504	158	1,333
Corinthos & Queeny	1975 Jan.	2,556	2,556					1,905			651	2,556
Shell Barge No. 2	1975 Apr.	708	708							18	690	708
Mitsui Maru No. 3	1975 Apr.	1,653	959	694				207		760	686	1,653
Ote Maru No. 15	1975 Apr.	1,358	467	809			82	605		600	154	1,358
Tsurusato Maru No. 3	1976 Feb.	184	177				7	12		42	130	184
Ethel H	1977 Feb.	1,037	1,034				3	23			1,014	1,037
Toyofuji Maru No. 2	1977 Sept.	468	179	255			34	27		66	375	468
Eleni V	1978 May	31		31	450					11	20	31(1)
Kurdistan	1979 Mar.	6,552	4,948	634					3,519	2,102	931	6,552(2)
Chevron Hawaii	1979 Sept.	8,010	8,010							3,779	4,231	8,010(3)
Princess Anne-Marie	1980 Jan.	30,000	134	29,866		800	170			3,967	26,033	30,000
		59,743	23,833	34,128	450	933	399	4,585	3,524	13,879	37,754	59,743

Notes: (1) Payment to fishermen; main claims not yet settled.
(2) Amount under "Other Sources" is in litigation, may become claim against Canadian Marine Pollution Fund.
(3) Settlements to date; about $300,000 still under negotiation.

Sources: Oil Companies Institute for Marine Pollution Compensation, November 1982.

Exhibit III-6

FUND OUTSTANDING CLAIMS AS AT SEPTEMBER 9, 1982
(at Dec. 31, 1982 exchange rates)

Vessel	Date of Incident	Location	TOVALOP or CLC	CRISTAL Involvement Yes/No	Total Amounts Claimed to Date U.S. $	Shipowners Gross Limitation U.S. $	Possible Other Sources of Compensation	Comments
Tarpenbek	June 21, 1979	United Kingdom	CLC	Possible	2,630,000	132,000	CRISTAL, Colliding Vessel	Question whether pure threat. UK and local governments, and owner are suing the Fund.
Furenas	June 3, 1980	Sweden	CLC	No	588,000	84,000	Colliding vessel	Fund paid all third-party claims. Difficulty is collecting from colliding ship.
Tanio	March 7, 1980	France	CLC	No	72,500,000	2,117,000	-	French government recently submitted final claim. Fund is reviewing the merit of the pumping operation claims.
Hosei Maru	August 21, 1980	Japan	CLC	No	1,047,000	152,000	-	Third-party claims paid. Fund owes minor amount to surveyor.
Ondina	March 3, 1982	West Germany	CLC	Yes	9,384,000	4,345,000	CRISTAL	Invoices on cleanup received from P & I Club. Fund awaiting report on cleanup and claims summary.
Shiota Maru	March 31, 1982	Japan	CLC	No	609,000	21,000	-	The Fund's surveyor is continuing to assess fishery damage claims.
Fukutoku Maru No. 8	April 3, 1982	Japan	CLC	No	3,009,000	89,000	-	The Fund's surveyor is negotiating settlement with fishermen.
Jose Marti	January 7, 1981	Sweden	CLC	No	2,645,000	2,330,000	Swedish Government	CLC Limitation Fund not yet established. Owner alleges defective charts. Detailed Swedish claim not yet submitted.
Suma Maru No. 11	November 21, 1981	Japan	CLC	No	59,000	31,000	-	Limitation Fund cannot be set up due to Japanese law in this case. Fund considering how to make payment.
Globe Asimi	November 22, 1981	USSR	CLC	Possible	943,000,000	1,713,000	-	Fund may have to pay indemnification to owner. Lawyer retained to see whether vessel complied with requirements. Large damage claim filed in USSR court.

Note: A claim against the Fund in the case of the Juan Antonio Lavalleja, which spilled 40,000 tons of LNG condensate in Arzew, Algeria, (December 28, 1980), has been rejected since it was not "persistent" oil.

Source: IOPC Fund Report 1981; IOPC Fund documents FUND/EXC.7/2 of July 19, 1982 and FUND/EXC.7/2Add.1 dated September 9, 1982; and TBS analysis.

Exhibit III-7

CRISTAL OUTSTANDING CLAIMS AS AT NOVEMBER 15, 1982

Vessel	Date of Incident	Location	TOVALOP or CLC	IOPC Fund Involvement Yes/No	Total Amounts Claimed to Date (at 11/15/82 exchange rates) U.S. $	Shipowners Gross Limitation U.S. $	Possible Other Sources of Compensation	Comments
Amoco Cadiz	March 1978	Brittany coast, France	CLC	No	$ 4,455,000	$16,700,000	Shipowner	This is the U.K. Government claim only. The French Government has not yet quantified its claim to CRISTAL, but in current U.S courts proceedings is reported to be claiming $2.2 billion from shipowner. There will also be a claim on CRISTAL by shipowner for oil clean-up costs.
Eleni V	May 1978	East coast, United Kingdom	CLC	No	6,477,000	1,845,000	(i) Shipowner (ii) Colliding vessel	This is a collision case which has resulted in complex litigation which in 1982 determined degrees of responsibility between colliding vessels. The U.K. Government is now considering whether there should be further legal action to deny right of limitation by shipowner(s).
Christos Bitas	October 1978	Milford Haven, United Kingdom	CLC	No	5,053,662	4,090,000	-	Protracted negotiations in progress between claimants and P & I Club on certain aspects of claims. Litigation may follow if there is no agreement reached between the parties.
Betelgeuse	January 1979	Bantry Bay, Ireland	TOVALOP	No	22,072,861	8,998,981	Shipowner	There will also be a claim from the Irish government in addition to amount shown. Complex litigation suits and claims negotiations are likely to be very protracted in this case.
Antonio Gramsci	February 1979	Ventspils, Russia	CLC & Russian law	Yes	94,767,355 (Russia) 2,687,127 (Finland)	954,432 (under Russian law)	-	This was a multi-state incident, Russia, Finland and Sweden involved. Sweden being a member of the IOPC Fund whose claims have been settled by the Fund in sum of Swedish Crowns 95,707,157. The Finnish claim has been received by CRISTAL but there has been a considerable delay in the submission of the full Russian claim.

(continued)

Exhibit III-7 (continued)

Vessel	Date of Incident	Location	TOVALOP or CLC	IOPC Fund Involvement Yes/No	Total Amounts Claimed to Date (at 11/15/82 rates) U.S. $	Shipowners Gross Limitation U.S. $	Possible Other Sources of Compensation	Comments
Tarpenbek	June 1979	Selsey Bill, United Kingdom	CLC	May be	2,835,000	$ 750,000	IOPC Fund	This is a borderline case between CRISTAL or IOPC Fund responsibility. There are differing opinions on when an oil spill occurred relative to "threat removal" measures being taken. The matter is likely to be litigated and if it is ruled as a "pure threat" incident then CRISTAL will be applicable, otherwise it will be a joint Fund/CRISTAL case.
Chevron Hawaii	September 1979	Houston, Texas, U.S.A.	TOVALOP	No	300,000	Not applicable	-	Appendix 'A' shows the main settlement in this case. U.S. $300,000 per this Appendix is balance of claims under negotiation.
Irenes Serenade	February 1980	Pylos, Greece	CLC	No	See comments	8,533,665	-	The principal claimant in this case is the Greek Government who have not yet submitted their claim although in January 1981, they gave an estimate of US $13,500,000. It is understood that leakage of oil from the sunken hull may still be continuing.
Ethel H	March 1980	Arthur Kill, New York, U.S.A.	TOVALOP	No	See comments	750,000	(i) Colliding vessel (ii) Towing vessel	The barge Ethel H was in tow when collision occurred. No claim has yet been submitted but it is understood that oil spill clean-up costs were approximately U.S. $1,000,000.
Ondine	March 1982	Hamburg,	CLC	Yes	See comments	4,500,000	IOPC Fund	No claim has yet been submitted to CRISTAL although it is estimated that clean-up costs will amount to US $11,000,000. This is basically an IOPC Fund case but, as the tanker was not registered in a Fund country, the shipowner will not be able to make an Indemnity claim against the IOPC Fund but is entitled to make such a claim under CRISTAL in the estimated amount of $1,120,000.

Source: Oil Companies Institute for Marine Pollution Compensation Limited, November 1982.

Exhibit III-8

IOPC FUND FINANCIAL SUMMARY

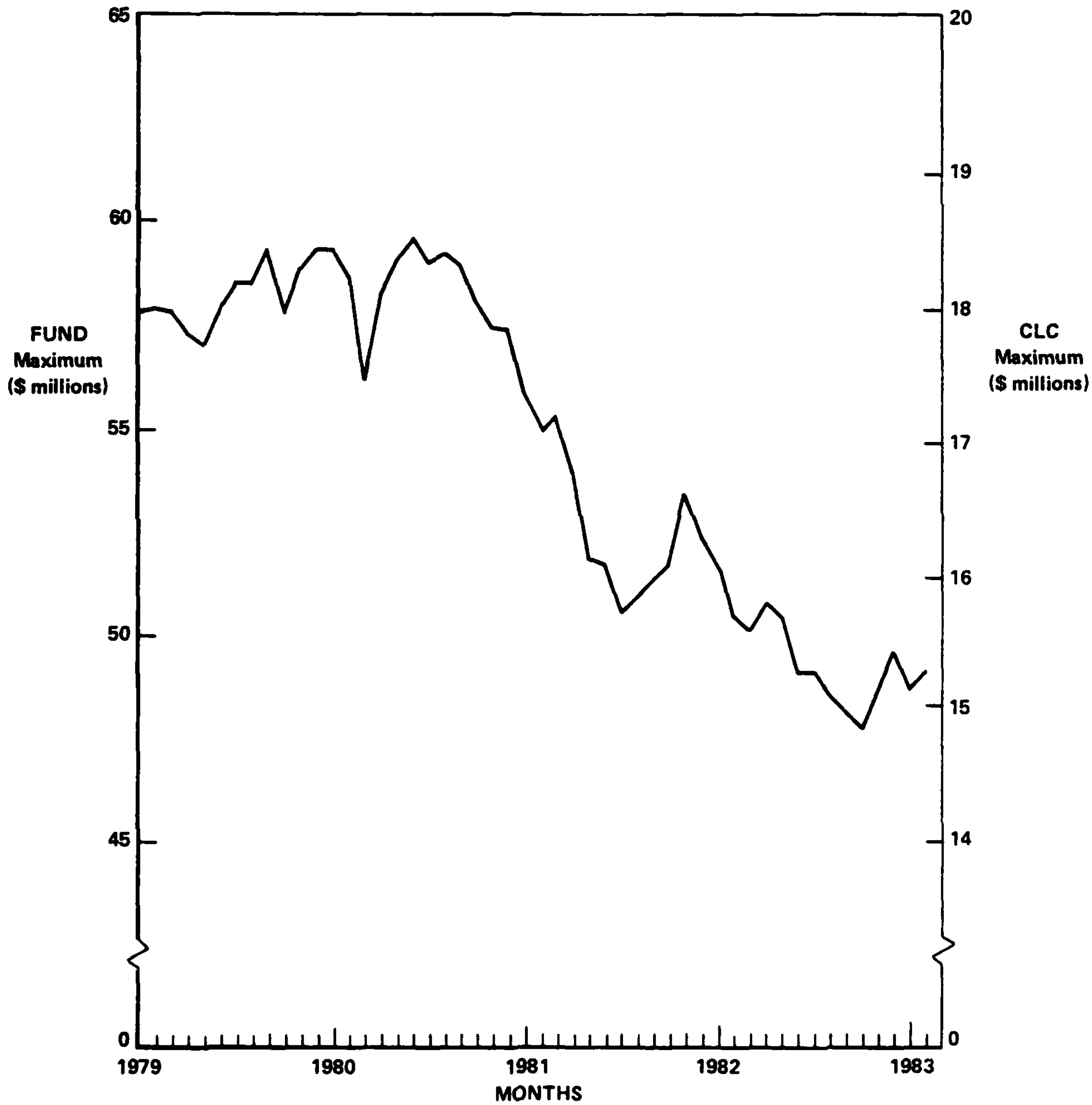
	British Pounds	
Year	Annual Contributions	Administrative Budget
1979	750,000	
1980	10,000,000	173,000
1981	500,000	190,000
1982		222,282
Cash and other assets on hand 12/31/80: £12.56 million.		

Source: Annual reports of IOPC Fund, 1978-1981.

Figure III-1

DOLLAR VALUE FLUCTUATIONS IN CLC AND FUND LIMITS

1979 TO PRESENT
(based on end-month dollar/SDR exchange rates)



Source: TBS analysis of IMF data.

IV. COMPARATIVE ANALYSIS OF THE CLC/FUND REGIME AND U.S. LAW

The purpose of this chapter is to compare the legal provisions under CLC/Fund with those available under present U.S. law reviewed in Chapter I. The following analysis compares the CLC/Fund and those laws in several different respects: liability created, limits to it, defenses, and provisions for removing liabilities.

The most significant comparison is between the provisions of the CLC/Fund and the FWPCA. This is because the FWPCA is the most frequently relied upon among the four statutory schemes providing for oil spill compensation and liability recovery. The Trans-Alaska Pipeline Authorization Act (TAPA), the Deepwater Port Act (DWPA), and the Outer Continental Shelf Lands Act Amendments (OCSLAA) all are narrower in their application than the FWPCA, applying respectively only to oil shipped through the Trans-Alaska pipeline, loaded at Valdez and offloaded at U.S. terminals; oil discharged at U.S. deepwater ports or from a vessel which has received oil from another vessel at the deepwater port or by the deepwater port itself; and oil discharged from a continental shelf production facility or from a vessel bearing it directly from such a facility.

A. COVERAGE

Basic coverage differs significantly between the CLC/Fund and the FWPCA. The CLC/Fund covers both cleanup costs and damage claims for tanker oil spills. The Federal Water Pollution Control Act applies to all vessels, but speaks only to the recoupment of cleanup costs by the Federal Government, derivatively by state agencies, and in instances where one of the four defenses arises (that is, act of God, act of war, negligence of the government or act or omission of another party) by the discharger. In addition, the vessel owner/operator is liable for the costs of replacement and rehabilitation of natural resources, which is a type of damage recovery. But in general, under the present situation, all others who suffer damage must look to maritime tort nuisance theories, or to state regimes, or, if the oil is transported through the Alaskan pipeline, or is at a deepwater port, or is continental shelf oil, to the other three statutory recovery schemes which do include damages.

On the other hand, the CLC Convention, Article III(4), provides that:

> No claim for compensation for pollution damage shall be made against the owner otherwise than in accordance with this Convention. No claim for pollution damage under this Convention or otherwise may be made against the servants or agents of the owner.

Thus, the convention asserts that it is the exclusive remedy in the case of a tanker oil spill as against owners of the ship at the time of the incident. Claims for recovery of losses due to oil damage against shipowners would, therefore, in a CLC-member nation, only come under the provisions of the convention (as opposed to claims against the operator where that is different, the onshore or offshore facility, the government, and third parties).

Further, the CLC applies only to sea-going vessels which are carrying oil in bulk as cargo at the time of the incident. It is by its terms not applicable to ballast voyages, inland vessels, or nontankers. The CLC and FUND are applicable only to persistent oil. These restrictions of coverage are not generally found in the terms of the U.S. legal regimes. In particular, the FWPCA applies to "every description of watercraft . . . other than a public vessel", whether a tanker or not, and to "oil of any kind or in any form."

The concept that a spill could affect the natural resources beyond the narrow territorial sea band is certainly present in U.S. law where it appears to be excluded under the coverage of the CLC and FUND. The geographical coverage under CLC/Fund is limited to a nation state's territory including its territorial sea, which includes waters up to 3 miles from shore in the U.S. By contrast, the FWPCA applies to the contiguous zone (12 miles), and in some circumstances applies also to the 200-mile fisheries limit and the Continental Shelf. The Deepwater Port Act goes so far as to include damage to the coastal environment of any nation. TAPA sets no geographical limits, and specifically includes any damages sustained by residents of Canada. And, of course, the OCSLAA applies to waters above the Continental Shelf. Maritime torts would also cover incidents and damages beyond the territorial sea and Maine's state law includes in some instances waters out to 12 miles.

Still another difference between the CLC statement and some of the U.S. existing law is in the breadth of the defined damages. Whereas the CLC speaks only in terms of cleanup costs and damages, the DWPA, for example, speaks in terms of damages to any

person, real property, personal property, natural resources of the marine environment, coastal environment of any nation, including damages claimed without regard to ownership of any affected lands, structures, fish, or wildlife, biotic or natural resources. The OCSLAA defines damages quite elaborately as being

> ". . . (A) injury to, or destruction of, real or personal property; (B) loss of use of real or personal property; (C) injury to or destruction of natural resources; (D) loss of use of natural resources; (E) loss of profits or impairment of earning capacity due to injury to, or construction of, real or personal property or natural resources [so long as the claimant 'derives at least 25 percent of its earnings from activities which utilize the property or natural resources']; (F) loss of tax revenue ['by the federal government and any state or political subdivision thereof'] for a period of one year due to injury to real or personal property."

These delineations make clear that the loss of natural resources is contemplated under the existing U.S. law, and this has been affirmed in several cases such as the ZOE COLOCOTRONI.

B. LIABILITY CREATED

The liabilities created in the CLC conceptually are very much like the liabilities created in all of the statutory remedies viewed above. The liability is strict, that is, not based on fault. The maritime tort recovery theories, of course, are based on negligence--concepts of fault or unseaworthiness, which is a form in most of its instances of fault. The statutory remedies have imposed limits, discussed below. A partial exception is OCSLAA provisions which are without any limit of liability as to removal costs and recovery by the government. Another exception apparently is the Maine act, which has no limit to its strict and absolute liability placed on licensees for spills.

The CLC establishes the liability of tanker owners, while the FWPCA and other U.S. statutues generally assign liability to the shipowner or operator. This can be significant, as the owner and operator are often unrelated parties. The CLC specifically assigns liability for the actions of crew or agents to the tanker owner. By contrast, in the State of Maine, liability for the acts or omissions of others--including ports' servants and agents, and vessels bound for Maine oil facilities while in Maine waters--is vicariously assigned to the licensed port facility.

C. ABILITY OF SPILLER TO RECOVER

There is a significant difference in terms of the access of the spiller to the limitation fund he establishes. Under CLC, any cleanup costs incurred by the shipowner are treated as equal claims upon the fund. In the case of the FWPCA, this access is greatly restricted. The spiller can only recover from the fund if the spill was caused solely by an act of God, an act of war, negligence on the part of the U.S. government, or an act or omission of a third party.

The OCSLAA provides for a type of liability not explicitly included anywhere else in that the spiller may be liable for the interest from the date of claim to date of payment. However, in practice, this has occurred on occasion under FUND and under FWPCA as well. Finally, the liability of the fund created in the State of Maine law provides administrative remedies for third-party claimants, a means believed to provide them an alternative to recovery under maritime tort theory which will be subject to the Limitation Act.

D. LIMITS OF LIABILITY

The owner's limit under the CLC is equivalent to $147 per convention ton with a maximum of $15.4 million (at end-1982 exchange rates). And the Fund's liability is limited to a total of $49.6 million, including any sum paid under CLC. Under the FWPCA, a comparable limit is $250,000 or $167 per convention ton ($150 per GRT), whichever is greater for each vessel (see Figure IV-1). While there is theoretically no upper limitation other than the tonnage of the vessel, practically speaking the tonnage of tankers entering U.S. waters is limited at present to around 120,000 convention tons. This would give a maximum practical liability under FWPCA of $20.0 million, only $4.6 million above the CLC limit. When the Fund's $49.6 million limit is taken into account, the combined CLC/Fund coverage exceeds the maximum FWPCA coverage with all vessels of current or foreseeable dimensions. However, the CLC/Fund limit would include all damages, including third party, while the present FWPCA limit covers only government cleanup costs, and any costs of its restoration and rehabilitation of natural resources. Thus a more apt comparison may be with one of the other three federal statutes which provides for government's and third parties' damages.

Additional mention should be made here of a few other comparisons. The OSCLAA provides a limit as to damages of $250,000

or $300 per gross ton, whichever is greater, but, as already mentioned, is unlimited in the amount of cleanup costs the government can recoup from the spiller. The DWPA does provide an absolute limit, the lesser of $150 per gross ton or $20 million. TAPA limits the shipowner's liability to a maximum of $14 million. In contrast to the $49.6 million limit of the international fund, the TAPA fund is limited to $100 million, but the OCSLAA and DWPA fund liabilities are unlimited. The Maine law channels the vessel's liability into that of marine terminal operator or licensee, thus circumventing the Limitation of Liability Act.

In contrast to these statutory limits, the maritime tort and nuisance limitations arise from the imposition of the federal shipowner's Limitation of Liability Act, the well-known limitation to the value of the vessel and her freight then pending, after the incident. (See Appendix B.)

E. <u>REMOVAL OF LIMITS</u>

As to provisions for removing limits, the CLC in some respects is more victim-favorable than recent U.S. statutes. Its conditions are that upon a showing of the owner's "actual fault or privity," the established limits may be removed, or broken. The FWPCA's standard for removing limits, "willful negligence or willful misconduct within the privity and knowledge of the owner" is a more difficult barrier. Normally, in tort law a standard of willfulness is a higher hurdle than mere fault. Among the other acts, the DWPA follows the FWPCA in requiring a showing of "gross negligence or willful misconduct within privity and knowledge" of the owner or operator as the case may be. There is probably comparatively little difference between gross and willful negligence for these purposes. The OCSLAA has lowered the barrier in its provisions for removing limits. It provides for the breaking of the limits when the "incident [is] caused primarily by willful misconduct or gross negligence within the privity <u>or</u> knowledge of the owner or operator, or is caused primarily by a violation, within the privity or knowledge of the owner or operator of applicable safety, construction, or operational standards or regulations of the federal government." In other words, under this most recent statutory enactment on the subject, the limits are removed if there is any failure of compliance with a very broad range of applicable federal regulation. Further, the relationship of willful misconduct or gross negligence, while maintained at that standard, only requires a showing of primarily causal relationships rather than solely or totally causal relationships.

As to maritime law, the limitation is that of the Limitation of Liability Act, and for the removal of limitation the standard is privity or knowledge of the owner. This may be a lower hurdle than the CLC's actual fault or privity, although no courts have, of course, made this comparison. Recent U.S. case law has considerably eroded this limitation, as discussed further in Appendix B.

F. DEFENSES

As to the discharger's defenses, the CLC provides somewhat narrower defenses than those provided in the FWPCA, but the defenses available under CLC are broader than the defenses provided under some of the other statutory U.S. enactments.

The CLC provides that the spiller may be discharged wholly of liability if the spill is caused:

1. By an act of war or a natural phenomenon of an exceptional, inevitable, and irresistible character; or

2. Wholly by acts or omissions done with intent to cause damage by a third party; or

3. Wholly by negligence of authorities in maintaining navigational aids.

Comparable FWPCA defenses require that the spill was solely caused by: an act of God, act of war, negligence on the part of the U.S. Government, or an act or omission of a third-party without regard to whether the actor was negligent or not, or any combination of these clauses.

With regard to the defense of governmental negligence, the CLC apparently provides for a narrower defense (related to navigational aids) as compared with negligence on the part of the United States Government (as provided in the FWPCA, OSCLAA, and TAPA). However, DWPA provides a defense similar to that in the CLC. Also, the CLC defense providing that the tanker owner may be discharged from liability, if the spill was caused by the act or omission of a third party with intent to cause damage is certainly narrower than the similar, but nonetheless different FWPCA defense where the shipowner can prove that the discharge was due solely to the act or omission of a third party without regard to whether the act or omission was or was not negligent.

TAPA removed two of the defenses, act of God and negligence on the part of the U.S. government. It also partially removed the provision that the defendant could shift liability to a third party if that third party was causal in the discharge by limiting that defense to the claims made by the third party who was causal in the discharge. The DWPA followed TAPA in eliminating the two FWPCA defenses and further qualified the act of negligence on the government's part by adding the CLC words regarding maintaining navigational aids.

The OCSLAA adds back act of God and the negligence or intentional act of the damaged party or any third party including any government entity. It thus becomes, along with the FWPCA, the only other of the four statutes to keep these two defenses.

G. THE DIRECTION OF THE LAST THREE CONGRESSIONAL ACTS

The real significance of the three other existing federal regimes may lie in suggesting the direction that Congress could take in considering future federal liability and compensation legislation. Since the passage of the FWPCA Amendments of 1972, the other three statutory schemes, passed in 1973, 1974, and 1978, have evidenced a continuing expansion of the liability imposed upon spillers of oil and of the associated terms and conditions. In 1973, enactment of the Trans-Alaska Pipeline Authorization Act provided for the first time the idea of a fund to assure that damages of all kinds would be compensable for all types of damaged parties. And the economic cost of such damages was clearly shifted to those who benefit from the oil industry, that is, the oil industry and the oil consumer. This is accomplished through financing the TAPA fund by a per barrel charge.

In 1974, the Deepwater Port Act expanded the liability of the fund created by its terms. Unlike the liability of the owner of the vessel and the licensee of the deepwater port, the fund's liability is not shielded by either of two of the defenses available to the licensee and the owner, that is, act of war and negligence of the Federal Government in establishing and maintaining aids to navigation. The fund may avail itself of a defense against claims by a party whose negligence caused the damage, however. The TAPA fund, a year earlier, provided the two defenses of an act of war or government negligence. Also the Deepwater Port Act provided an innovation in terms of allowing the U.S. Attorney General to institute class actions "on behalf of any group of damaged citizens he determines would be more

adequately represented as a class in recovery of claims." It also provided that the Secretary of Transportation "on behalf of the public as trustee of the natural resources of marine environment" could sue and recover damages for such resources and then apply the sums recovered to the restoration and rehabilitation of the natural resources.

Finally, in 1978 the Outer Continental Shelf Lands Act Amendments provided that vessel and facility owners and operators were strictly liable and precluded with respect to removal costs, applicability of limitations, exceptions, or defenses.

In sum, Congress has progressively provided stronger provisions for recovery of cleanup costs and damages. Referring to the last act, the OCSLAA, one commentary has said: "In all, this act contains by far the most comprehensive and far-reaching provisions that have appeared to date in any federal legislation dealing with oil pollution. And if only because it was the most recent federal enactment, it is probably the most significant backdrop for Congress's current consideration of the various legislative proposals for a comprehensive 'Superfund' act." (Mendelsohn & Fidel, Liability for Oil Pollution--U.S. Law. 20 J. of Maritime L. & Comm. 475, 1979).

H. SUMMARY

Several points appear to stand out in the above analysis. Perhaps most significant is that accession to the CLC/Fund system would bring coverage for damages in addition to cleanup costs into the mainstream Federal statutory scheme. Persons who sustained damages from oil spills would know they had a statutory remedy and would no longer have to rely on voluntary industry agreements, on the vagaries of tort remedies, or on the activity-specific coverage.

However, the CLC speaks only to the owner's liability, and to spills of persistent oil from laden tankers or seagoing tank barges. Thus, the liability of other parties and for other types of spills would remain in place with continuing inconsistencies and differences. Other parties could include facility owners, vessel operators, charterers, third-party causers or discharges, and the various federal and state funds where liability is different from that of the IOPC Fund. Other types of spills could include those from tankers in ballast, from other vessel types, and of nonpersistent oil.

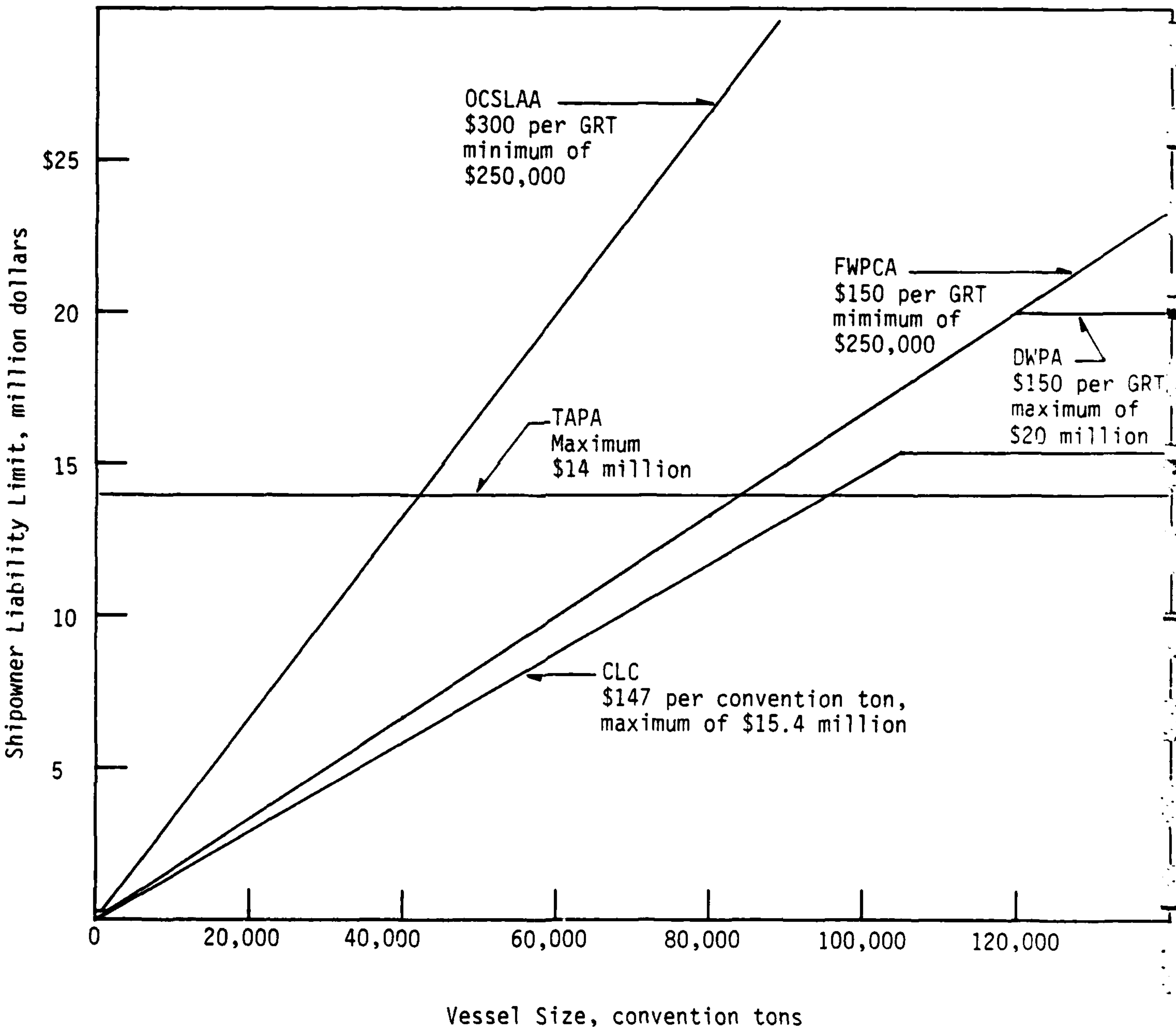
The coverage presently available under the combined CLC/Fund regime is very substantial when laid alongside that of the FWPCA and of OCSLAA, Congress's most recent statement on the subject. This is significant, since the trend of Congress's last three statutory enactments has been toward fuller coverage of cleanup costs and damages. The liability limit assigned to shipowners under CLC is similar to that under FWPCA, while under OCSLAA the per-ton limitation is higher and there is no limitation regarding clean-up costs.

The limit on the CLC becomes particularly important since by its terms it becomes the exclusive remedy against the shipowner available to those who cleanup and those who suffer damages.

Adoption of the CLC/FUND by the United States through accession would necessarily involve the United States Congress in implementing legislation. It therefore provides an opportunity to address the issue of the creation of one overall regime for U.S. oil spill liability and compensation.

Figure IV-1

COMPARISON OF SHIPOWNER LIABILITY LIMITS:
FEDERAL STATUTES vs CLC



V. U.S. AND WORLD SEABORNE PETROLEUM TRANSPORTATION

A. BACKGROUND

The transportation of petroleum in bulk began in 1886 and is today the largest segment of international and domestic seaborne transportation. The transportation of crude petroleum accounts for more than 80 percent of international seaborne petroleum transportation and the transportation of petroleum products accounts for the remainder. Crude oil and persistent petroleum products, including residual fuel oil, No. 4 distillate oil, asphalt, and lubricating oil, are the primary cargoes spilled in serious bulk petroleum incidents at sea and are, therefore, the focus of this chapter. In two regimes, FUND and CRISTAL, these cargoes are also the basis of contributions to funds to provide pollution compensation. It is necessary to understand and quantify the nature of these seaborne petroleum trades in order to evaluate the costs and benefits of ratification of FUND and CLC by the United States.

B. OVERVIEW OF PETROLEUM LOGISTICS

The transportation of crude oil or petroleum products is a critical element in the world's largest major process industry. While the range of petroleum products is wide, petroleum in all its forms remains a classic commodity: it is held, refined, traded, blended, and sold in response to often volatile international and domestic industrial, political, and economic conditions. The number of suppliers and the number of customers makes for a highly competitive marketplace for petroleum sales and transportation.

1. Crude Oil Logistics

The vast majority of crude oil is delivered to refineries for immediate refining or for operating inventories. Some countries, including the United States and Japan, have stockpiles of crude oil, managed by government agencies. The logistics of persistent oils are presented schematically in Exhibit V-1. Crude oil is pipelined overland to terminals or undersea from offshore production platforms to terminal platforms for tanker loading or directly to shore. Crude oil pipelines can be national, such as the United States Trans Aleyska Pipeline, or international, such as the SEPL pipeline, which brings crude oil from

the Marseilles area to refineries in Germany and Switzerland. Tankers and tank barges in sizes from 500 tons to 550,000 tons can deliver crude from portside loading terminals to receiving ports. Large tankers also frequently transfer crude oil to other, frequently smaller, tankers via transfer pipelines such as Saudi Arabia's Trans Saudi pipeline, Panama's Trans Panama Pipeline, or Egypt's Suez-Mediterranean pipeline. Because of port draft limitations, U.S. receipts of some crude oil are transshipped at terminals en route, often at Caribbean locations such as Curacao (Shell Oil), Bonaire (Paktank/Northville), Aruba (EXXON), Trinidad (Texaco), Bahamas (Burmah Oil), Little Cayman (Transportation Concepts), and Parita Bay Panama (Northville). In addition, refineries at some U.S. ports, notably New York Harbor, Delaware River, New Orleans, Port Arthur, Houston, Galveston, Corpus Christi, Freeport, and San Francisco, utilize open sea or inshore ship-to-ship or ship-to-barge lightening and lightering to reduce inbound ship drafts by transferring some or all crude oil to tankers or tank barges. Because of draft restrictions at most U.S. crude oil ports, U.S. crude oil logistics tend to be more complex and draft restrictive than they are in most industrialized nations.

2. Residual Fuel Oil Logistics

The logistics of persistent petroleum products are characterized by relatively small lot sizes of up to 50,000 tons, and delivery to industrial terminals or industrial users. Residual oil, as a byproduct of refining, is delivered to refiners for reprocessing, to utilities for power generation, and to industrial users to generate power or heat. Refineries and utilities tend to receive residual oil in lot sizes of up to 50,000 tons, while industrial customers tend to receive residual oil in smaller lot sizes. Residual oil deliveries to ships for use as fuel can occur in lots as small as 500 tons. Because of the very high viscosity of residual oil, it must be heated to be economically pumped to and from tanks and tank vessels. It cannot be pumped distances of more than a few miles without being heated. Transportation is primarily by tank vessels, which may or may not be heated, depending on ambient air and sea temperatures, the temperature of the oil when loaded, and the duration of the voyage.

3. No. 4 Distillate Logistics

No. 4 distillate oil is primarily utilized as a heavy, relatively low-sulfur, low-cost fuel for industries and utilities. It is delivered by tankers and tank barges. It can be pipelined limited distances when heated. No. 4 distillate is not pumped

between regions in the United States because of its viscosity. No. 4 oil is not normally heated when transported by sea.

4. Other Persistent Oil Logistics

Asphalt and road tars and oils are highly viscous refinery byproducts that are utilized primarily for highway, parking lot, and residential construction. A small retail market exists for asphalt for consumer use, but these asphalts tend to be highly processed, packaged in cans or barrels, and transported by truck. Asphalt in bulk is transported by railroad cars, heated tank trucks, and heated barges and tankers. Because of the highly viscous nature of these cargoes, most tank barges and tankers in the asphalt trade are dedicated to asphalt transportation and are specially outfitted with high-temperature cargo-heating and pumping equipment.

Lubricating oil is unique in that it is most commonly delivered to its ultimate customers in cans, bottles, or barrels. Accordingly, much of the seaborne trade supports the distribution of large lots (up to 30,000 tons) of basic lubricating oil stocks from refineries to processing/packaging plants. Some lubricating oil is delivered in bulk to ships in harbors for the ship's use; but even these deliveries often involve pumping barreled lubricating oils from barrels to ships' tanks.

C. USES FOR PERSISTENT OILS

1. Crude Oil

Crude oil is refined at refineries and reprocessed into a variety of products, including the following:

- Gasoline--"gasoline" for automobile, light truck, boat, propeller airplane, and small engine consumption. Gasoline is not persistent.

- Jet Fuel--"jet fuel," "avjet" for commercial and military jet aircraft. Jet fuels are not persistent.

- Kerosine--for jet aircraft, home space heating, tractor fuel, and gas turbine fuel. Kerosine is not persistent.

- No. 2 distillate fuel oil--"diesel oil," heating oil," "gas/oil" for home heating, retail heating, small plant heating, high-speed diesel fuel for small ships, locomotives, trucks, trains, and generators. This fuel is persistent.

- No. 4 distillate fuel oil--"intermediate fuel oil" for industrial space heating, low- and medium-speed diesel fuel for ships and generators, and utility consumption. This fuel is persistent.

- No. 6 distillate fuel oil--"residual oil," "Bunker C" for steam-fired utility plants and ships, large slow-speed diesel engines for ships and generators, industrial heating and power, steam generator, refinery fuels, and refinery feedstock. No. 6 distillate is persistent.

- Lubricating oils and greases--"lube oil" to lubricate moving mechanical parts. Lubricating oils and greases are persistent.

- Asphalt, tars, and road oils--to pave public and private roadways. These products are persistent.

- Petrochemical feedstocks--to supply the petrochemical/plastics industry with primary material. These products are nonpersistent.

- Other products include petroleum coke "petcoke" for the steel and chemical industries. Most of these products are nonpersistent; some are solids.

U.S. refinery operations have historically been based on gasoline production. Refining capacity has traditionally been set to maximize financial performance by optimizing the volumes of high-value products offered to the marketplace. Lubricating oils, petrochemical feedstocks, gasoline, and distillate oil are higher valued products. Residual oil is priced as a byproduct that must be sold to customers or reprocessed and upgraded to permit refinery operations to continue. At most times, residual oil is sold for significantly less than the cost of crude oil, while lubricating oils, gasolines, distillate oils, and feedstocks are sold for significantly more, as Exhibit V-2 shows. These pricing relationships illustrate that refineries must recover fixed and operating costs from the products they produce, consistent with the constraints of the marketplace.

2. Residual Fuel Oil

Residual fuel oil is used by heavy industry as the cheapest petroleum fuel oil available. Because of its viscosity, it tends to be purchased, transported, and consumed at large industrial sites that can receive the fuel from ships and barges and can heat and sometimes treat the fuel prior to combustion. Many plants treat residual fuel by removing water and impurities mechanically or chemically. Exhibit V-3 tracks the consumption and composition of residual fuel oil consumption in the United States since 1970. Vessel bunkering (fueling) and utilities account for nearly 70 percent of consumption, while industrial use, plant heating, and oil company use (for refinery re-running and heating) accounts for the remainder. Consumption peaked in the mid to late 1970s and has declined sharply as some utilities and industries converted to coal and natural gas in response to rapidly rising residual fuel oil prices in 1979 and 1980.

Fuel oil costs are a major component of vessel bunkering and utility costs. Fuel costs as a percent of total cost are in relatively high percentages of the total costs of the marine industry and utilities. Both industries are capital-intensive; in both industries provisions exist to pass on some or all fuel costs and price changes. These fuel cost escalation provisions were emphasized in response to the turbulent fuel oil prices that have occurred since 1973. Ships are frequently chartered by owners to operators and/or customers at rates exclusive of fuel costs. Fuel costs are directly passed through to the charterer. Other shipping operations file tariffs that frequently include provisions for the levying and adjustment of bunker surcharges.

Industrial use of fuel oil accounts for a much smaller percent of total costs and revenues than utility or marine use. In general, fuel costs are less than 10 percent of total business costs. Fuel costs tend to be incorporated into the business cost base and passed on to customers, as are other costs and cost increases. In competitive industrial environments, it is more likely that some portion of a fuel cost increase might be withheld from the customer for some period of time. However, the pricing of most goods and services is complex and sensitive to market variations.

3. No. 4 Distillate Oil

No. 4 distillate oil is primarily consumed by utilities as a generator and boiler fuel and by industries as a heating fuel oil. Exhibit V-4 summarizes the composition of its consumption, which is dominated by nonmanufacturing facility space heating.

Utility consumption accounts for less than 5 percent of demand and has declined in recent years.

4. Other Persistent Oils

Lubricating oil is utilized by all types of machinery and is marketed by oil companies in small lots and in bulk. Most lubricating oil is transported in cans, bottles, and barrels. Only a small portion of lubricating oil moves by water in bulk. The majority of this traffic is between refineries and processing plants for packaging or from refineries to final bulk customers, such as ships and major clients.

Tars and asphalt products are priced at the wholesale and retail levels to meet market conditions dictated by market supply and demand. Most U.S. refineries maintain ample asphalt capacity as a means to add value to residual oil byproducts.

D. WORLDWIDE PERSISTENT PETROLEUM TRADES

1. Overview of World Petroleum Demand

Crude oil is primarily transported by pipeline, tanker, and tank barge. As Exhibit V-5 shows, in 1981, 2.9 billion metric tons of crude oil were consumed worldwide. Of this, 1.43 billion metric tons or nearly one half moved in international trade. The remainder was refined in the nations where it was produced. In 1981, 1.21 billion metric tons moved in interregional seaborne trade. This was nearly 85 percent of all international trade. The remaining crude oil was transferred from country-to-country by sea or pipeline within regions. Forty-two percent of world crude oil consumption moved in international seaborne trade.

The world's petroleum demand peaked in 1979 at 3.1 billion metric tons per year, up from 2.3 billion tons in 1970. By 1981 world demand had declined to 2.9 billion tons and consumption in 1982 is projected to fall another 2 to 3 percent. This reversal in total world demand was accompanied by even more volatile fluctuations in world petroleum transportation by sea. As Exhibit V-5 shows, crude oil traffic in international trade peaked in 1979 at 1.5 billion metric tons, but transportation, as measured in ton-miles, peaked in 1977. The exhibit shows that even as tonnage continued to increase through 1979, the average distance of crude oil transportation declined from an average 7,200 miles in 1976 to 6,300 miles in 1979 and to 6,100 miles in 1981.

The decreasing average crude oil voyage lengths since 1976 combined with decreasing tons of cargo since 1979 resulted in dramatically lower transportation demand. Relative to an all-time high of 10.5 billion ton-miles in 1976, 1981 international seaborne crude oil traffic declined to 7.4 billion ton-miles, a decline of 30 percent in five years. This decline had a very significant effect on the world tanker industry because tanker supply increased and rates fell to very low levels. This is discussed in detail in Chapter VI.

Exhibits V-6 and V-7 graphically present the composition of the world crude oil trade and show world trade by sea and U.S. imports in tons and as a percentage of total consumption. The relatively stable relationship of world seaborne crude oil traffic relative to world consumption is evident. The declined role of the United States in international trade is also evident. This is due in part to Alaskan crude shipments, which displaced some imports, and a decline in U.S. crude oil demand.

2. The World's Major Persistent Petroleum Trades

The world's interregional petroleum trades are dominated by crude oil, which accounts for nearly 85 percent of trade. The movement of petroleum products, i.e., the remaining 17 percent, and residual fuel oil accounts for at least half of the product's traffic. Crude oil accounts for nearly 90 percent of all ton-miles of petroleum transportation because of the longer voyages required. Exhibit V-8 presents a summary of the international interregional crude oil trade, while Exhibit V-9 presents key measures graphically.

The world's petroleum trades are dominated by Persian Gulf crude oil loadings. In 1981, the Persian Gulf loaded 50 percent of all interregional crude oil traffic. As Exhibit V-10 shows, Western Europe and Japan are the major receivers. The United States receives less than 10 percent of Persian Gulf loadings. The Persian Gulf trades tend to use the largest cargo lot sizes of any trade because of the long distances and volumes of traffic involved. Persian Gulf eastbound traffic transits the Persian Gulf, Straits of Malacca, and then moves east to the sub-Asian continent, the Far East, Australia/Oceana or the U.S. West Coast. Traffic moves westbound to the Mediterranean via pipelines to Syria or Lebanon or Saudi Arabia's Red Sea coast in tankers via the Suez Canal, the Suez-Mediterranean pipeline, or tankers via South Africa's Cape of Good Hope. Exhibit V-10 shows that tanker traffic to the United States and Western Europe via the Cape of Good Hope declined sharply after the Suez Canal was reopened in 1975.

Other major trade routes include the Caribbean/Latin America to U.S. route, which is composed of crude oil and products. North Africa to Western Europe, which includes Mediterranean and Northern European destinations, and the Persian Gulf to Latin America and Persian Gulf to U.S. trades.

E. U.S. PERSISTENT OIL TRADES

1. Petroleum Demand

Petroleum has been the largest single source of energy in the United States since the 1930s. Prior to the 1970s, domestic crude oil production supplied almost all of U.S. petroleum refinery needs. As demand increased and domestic crude oil production peaked, imports of crude petroleum to the U.S. East Coast increased rapidly. During the 1970s, a network of crude and petroleum products trades emerged, which changed daily in response to petroleum supply, demand, and price and the competing and complementary logistical infrastructure of ports, pipelines, terminals, ships, and barges.

Exhibit V-11 shows that national energy and petroleum demand peaked in 1979 and has declined since because of conservation, economic recession, and changes in the national economy. Both total energy and national energy patterns moved in general unison, but, as Exhibit V-12 shows, petroleum consumption as a percent of total national energy consumption peaked at 49 percent in 1978. 1982 total national petroleum consumption was 42.8 percent of energy demand. Coal and nuclear power increased their shares of national energy demand. Exhibit V-13 graphically summarizes national petroleum demand. 1982 consumption through September averaged 15.3 million barrels per day, compared to 16 million barrels per day in 1981 and the 1978 peak demand of 18.8 million barrels per day.

Crude oil serves as the basis for almost all domestic petroleum products production, but refineries also process a relatively small volume of oils that must be further refined. Exhibits V-14 and V-15 summarize U.S. crude oil composition since 1970. Total crude oil runs to refineries peaked in 1978 and 1979 at 14.7 million barrels per day and declined subsequently to less than 12 million in 1982. Imports of crude oil peaked in 1979 at 6.5 million barrels per day and have declined to less than 4.0 million barrels per day as national demand decreased. Crude oil imports accounted for 45 percent of crude oil runs in 1977, up from only 12 percent in 1970, but by 1982 had fallen to less than

30 percent of crude oil runs. As crude oil demand decreased, stable domestic production became a larger portion of crude oil supply.

Except for residual fuel oil, the United States is relatively self sufficient for petroleum products. Exhibit V-16 shows that gasoline, distillate, and jet fuel imports are all small compared to residual oil imports. U.S. petroleum companies have traditionally preferred to have the capacity to refine all light products (products except residual fuel oil) for the United States in the United States to maximize marketing efficiency and minimize political and economic risks. Traditionally, high-quality domestic crude oils have allowed U.S. refineries to emphasize gasoline and diesel oil production and minimize byproduct residual oil production. Any short-fall in domestic residual oil supply was conveniently made up by near-by, large-scale, American-affiliated refineries in the Caribbean and Venezuela, which relied on heavier, higher sulfur foreign crudes and which produced a larger fraction of residual oil per barrel of crude oil refined.

Exhibit V-17 traces national residual fuel oil supply. Between 1970 and 1977, residual oil production increased from 0.7 to 1.8 million barrels per day and from 6 to 10 percent of U.S. crude oil runs. Since the 1977 peak in residual production, residual production has fluctuated between 9 and 12 percent of refinery runs, but overall residual production declined to 1.1 million barrels per day as national refinery output declined. It is also evident that residual oil supplied to the U.S. economy has nearly dropped by half from 1977 because of coal conversion by utilities and heavy industries, conservation, and economic trends. Imports of residual oil have also declined by half since 1977.

Exhibit V-18 tracks imports of persistent petroleum commodities since 1977. Consistently, crude and residual fuel oils dominate the import side. Exhibit V-19 presents a similar history for exports. Lubricating oil and residual oils have been major export commodities in recent years.

2. Imported Oil Trading Patterns

U.S. imports of persistent oils are dominated by crude oil, and condensation and unfinished oils that are classified as crude oil by many government agencies. Residual fuel oil imports are second in importance and imports of No. 4 distillate oil, asphalts, and lubricants are negligible, as Exhibit V-18 shows. Exhibit V-19 shows that in 1981, 82 percent of all U.S. imports

were crude and unfinished oils. Residual fuel oil accounted for 15 percent of imports and imports of all other persistent oils including No. 4 distillate, asphalt, tar, and lube oils accounted for less than 1 percent of imports. The exhibit also shows that 55 percent of persistent oil imports was crude oil to the Gulf Coast; 22 percent of persistent oil imports was crude oil to the Atlantic Coast, and that 14 percent of persistent oil imports was residual oil to the Atlantic Coast. Only 6 percent of all persistent oil imports was delivered to the Pacific Coast, primarily crude oil.

Deliveries of crude oil to the U.S. Gulf and Atlantic Coasts are restricted by U.S. harbor drafts of approximately 40 feet. To achieve economies in transportation by larger tankers, transshipping of crude oil from large tankers to smaller tankers is performed at Caribbean terminals, lightering of all the cargo on large tankers to smaller tankers is performed, and lightering of portions of the cargo on a large tanker to smaller tankers or barges is performed in international and U.S. waters, bays, and harbors.

Exhibit V-20 tracks U.S. exports of persistent oils. Exports are negligible and are dominated by lubricating oil exports. Exhibit V-21 analyzes the volume and composition of crude oil, residual, and No. 4 distillate imports to the United States. Crude oil import flows trace the decline in Canadian imports since 1970, when Canadian imports (mostly delivered by pipeline) accounted for 51 percent of U.S. imports. By 1981, Canadian imports had declined to 60 million barrels and were only 3.7 percent of U.S. imports. Major increases in imports were from Saudi Arabia, Nigeria, Mexico, the United Kingdom, Indonesia, and Algeria.

3. Domestic U.S. Persistent Oil Trading Patterns

Residual oil imports to the United States are dominated by Venezuelan and Caribbean sources and have declined with the major suppliers, Venezuela and the Netherlands Antilles experiencing the majority of the decline. The U.S. Virgin Islands is the U.S. mainland's third-largest source of residual oil. Trade between the Virgin Islands and the U.S. can be performed by non-U.S.-flag ships (the Jones Act is not applicable).

No. 4 distillate oil is also almost entirely supplied by Venezuelan and Caribbean refineries and is delivered to the U.S. Atlantic Coast. Venezuela and the Netherlands Antilles are the primary sources, followed by Trinidad/Tobago.

virtually all crude oil and lubricating oils, 80 percent of residual oil, and 68 percent of No. 4 distillate. Barges carry 20 percent of all coastwise residual oil, 32 percent of No. 4 distillate, and 74 percent of asphalts. Barges dominate the lakewise and internal (local harbor and estuarial) trades.

F. CONTRIBUTING OIL ANALYSIS

1. Purpose

The United States will be a major contributor to FUND and the cargo owners with U.S. cargoes are today major contributors to CRISTAL. This section reviews contributing oil under the FUND convention, examines the characteristics of the oil trades of FUND members, estimates U.S. contributing oil under FUND, and examines the magnitude of U.S. oil flows in the context of FUND.

2. Comparison of FUND Contributing Oil and CRISTAL Assessment Call Oil Trade Volumes

The definitions of FUND contributing oil and CRISTAL cargo ownership oil are very similar for a given nation, assuming that all CLC import cargoes are owned by companies in that nation. The two primary differences are the specific coverage of asphalt, road oils, and tars under CRISTAL's "persistent" hydrocarbon mineral "oil" definition, whereas FUND's contributing oil definition covers crude oils and fuel oils (distillates, residuals, and blends) intended for use for the production of heat or power. FUND contributing oil does not include lubricating oils and greases or asphalt, tars, and road oils. The second major difference is that CRISTAL excludes from assessment crude oil which is received solely for transshipment for onward transportation (Clause 7(a)(2)(i)), while FUND contributing oil includes such transshipped crude. Overall, TBS estimates that FUND's lubricating oil and asphalt products are less than 1 percent of total U.S. persistent oil seagoing vessel trade. The CRISTAL exclusion of estuarial and internal fuel oil moves is estimated to result in an 8 to 10 percent reduction in assessment call oil relative to the full range of persistent hydrocarbons covered by CRISTAL. Exhibit V-28 summarizes the terms for FUND and CRISTAL coverage.

4. U.S. Domestic Oil Trading Trends

The U.S. domestic persistent oil trades are dominated by the major flows identified in Exhibit V-22. Alaskan crude oil movements to Pacific, Gulf, and Atlantic Coast refineries dominate the trade and account for the majority of U.S. domestic persistent oil activity. Other major trades include residual oil from the Gulf to the Atlantic Coast, along the Atlantic Coast, and local moves within the New York harbor.

Exhibit V-23 summarizes the composition of U.S. persistent oil trades. Exhibit V-24 tracks trends in key U.S. persistent oil components. After a gradual decline, domestic crude oil shipments rebounded in 1977 and 1978 when the Trans Alaska pipeline started up. Residual oil shipments have varied widely in recent years.

5. U.S. Tank Vessel Persistent Oil Carriage

The U.S.-flag seagoing tank vessel fleet is composed of 340 tankers and 721 barges with a total capacity of more than 17 million deadweight tons. The majority of the U.S.-flag tanker fleet is engaged in persistent oil transportation. Only a small minority of the tank barge fleet is engaged in persistent oil transportation. Like the world fleet, the U.S. fleet includes a mix of oil company-owned and independently owned capacity. The specific tank vessels engaged in persistent oil transportation varies with market conditions and economics. A significant portion of the tanker fleet is subsidized and these ships operate in foreign trades with operating subsidies, are chartered to the federal government, or carry Alaskan crude oil from Valdez, Alaska, to Panama for periods of up to six months per year, as permitted by the Maritime Administration.

Exhibit V-25 summarizes the U.S. commercial tank vessel fleet. The total capacity of U.S.-flag tankers increased from 7.5 million deadweight tons in 1970 to 14.1 million deadweight tons in 1981, and the average size of tankers more than doubled. The capacity of the barge fleet doubled, while the average barge size increased by 75 percent. The United States is unique in its use of very large barges for the long-haul transportation of petroleum. Barges in sizes up to 55,000 deadweight tons directly compete with tankers for crude oil and residual oil cargoes. Exhibit V-26 describes U.S. seagoing trades and the use of tankers and tank barges. Exhibit V-27 summarizes the relative shares of tankers and tank barges in the crude, residual, No. 4 distillate, and asphalt trades. In the coastwise trades, tankers carry

3. CRISTAL Assessment Call Oil

CRISTAL's manager, the Oil Companies Institute for Marine Pollution Compensation Ltd., does not collect assessment call oil information by nation because of its cargo-owner/company-specific orientation. Accordingly, no CRISTAL data for the United States or any other nation is available. No significant problems have been encountered in collecting these calls.

Exhibit V-29a summarizes CRISTAL assessment call oil for 1971-1981 and compares these flows to FUND contributing oil and world interregional seaborne trade. The exhibit indicates that because of CRISTAL's membership, its share of worldwide persistent oil traffic is very high. CRISTAL estimates its share of seaborne persistent oil traffic at 93 to 95 percent. It is also evident that the FUND share of persistent oils increased in 1981 with the inclusion of Spain and the Netherlands in FUND.

4. FUND Contributing Oil

Exhibit V-30 presents the contributing oil receipts for FUND countries for the 1978-1981 period. Contribution tonnage peaked in 1979 at 965 million metric tons and by 1981 had declined to 915 million metric tons. Japan is the single largest contributor, with contributions that have declined from 37.6 percent of the total in 1978 to 31.5 percent of the total in 1981. Japan's declining share is largely due to the addition of Spain and the Netherlands as FUND members in 1982. Japan, Italy, France, the United Kingdom, the Netherlands, Spain, and West Germany accounted for 87 percent of all contributions in 1981. Overall shares remained fairly stable, until the addition of Spain in 1981. The receipts by all major countries have declined since 1979. The levels of major nations' contributing oil receipts tend to move in unison, which helps to maintain relative shares.

5. Foreign and Domestic Activity

Like the United States, all countries--including FUND members--have international and domestic persistent oil receipts and traffic. Nations with long coastlines and islands tend to have significant domestic activity. Exhibit V-31 shows that the United Kingdom, Japan, and Italy have significant domestic trades. For each ton of imported crude and residual oil, an additional 0.3-0.8 tons was transported domestically. The United Kingdom's and Sweden's significant domestic component of

contributing oil includes North Sea crude oil receipts from national zones as well as domestic coastwise trading. Japan's mountainous terrain and many islands create a major requirement for short sea navigation. Italy also has a significant coastwise residual oil trade, and in addition, it receives oil for delivery by pipeline to other European nations.

In contrast, West Germany contributes only about .3-.6 tons of contributing oil per ton of imported oil because of it relies on pipelines from the Netherlands, Italy, and other nations. In these situations, the French and Italian crude oil receivers pass through their FUND contributions to the ultimate receivers of transferred oil. FUND costs are passed from the contributing nation to the oil's users without any significant problems.

Another aspect of domestic persistent oil trades is the use of small tankers to make parcel and small shipload deliveries of residual oil, No. 4 distillate, asphalts and lube oils. The experience of TOVALOP/CRISTAL and CLC/FUND has shown that in the past, small tankers have had mishaps that have been relatively costly per ton of oil spilled. The costs of these incidents have also frequently exceeded the per gross or convention ton-based ship liabilities and resulted in payments by the cargo-related regimes CRISTAL and FUND.

Exhibit V-32 presents the small tanker fleets for selected FUND members and the United States. Japan is by far the largest operator of small tankers, many of which operate in the persistent oil trades. Japan operates more than 700 tankers of less than 500 gross tons compared to nine in the United States, for example. Japan, Italy, and the United Kingdom operate the world's largest fleets of small tankers and therefore have the potential to have incidents and FUND payments for small tanker incidents. Exhibit V-33 identifies other CLC/FUND nations with tanker fleets that include many small tankers. Indonesia has a relatively large fleet of small tankers engaged in intra-island operations. The United States has very few small tankers, but does have the world's largest fleet of barges in seagoing trading. On this basis, the United States is likely to have common interests and sensitivities with regard to small ship transportation of persistent oils.

6. Estimated U.S. Share and Volume of U.S. FUND Contributing Oil

Consistent with the terms and specifications of FUND contributions, U.S. contributing oil has been estimated. These estimates are based on analysis of U.S. Army Corps of Engineers

Waterborne Commodity Statistics Center data. Nonseagoing and local traffic has been deleted for major trades including the Mississippi River System, Gulf Intracoastal Waterway, and the Columbia/Snake River. Intra- and intercoastal traffic has been included. The data exclude receipts of Alaskan crude oil at Panama. Panama is not a U.S. territory and is not a member of FUND. If Panama were a FUND member, transshipped oil would be considered as contributing oil, requiring payments by Panama. The U.S.-flag cargoes would incur the cost of any assessment calls at the terminals in Panama. Ultimately, this cost would be borne by U.S. consumers. As Exhibit V-34 shows, the U.S. share of FUND contributing oil, had it been a member, would have ranged from a high of 38 percent in 1978, to 33 percent in 1981. The share of FUND's largest contributor, Japan, would have declined to 21 percent in 1981, down from 23 percent in 1978. It is evident that had the United States joined, its share of FUND contributions would have been only slightly higher than Japan's actual share during the 1978-1981 period, without the United States. In 1981, the U.S. share of 32.6 percent can be compared to Japan's actual share of 31.3 percent. Exhibit V-35 plots the U.S.'s and Japan's shares with and without the other country. Had Japan withdrawn from FUND, the U.S. share of FUND contributions would have been 41 percent in 1981, down from 49 percent in 1978. Japan's highest actual share of FUND contributions occurred in 1978 (37.5 percent).

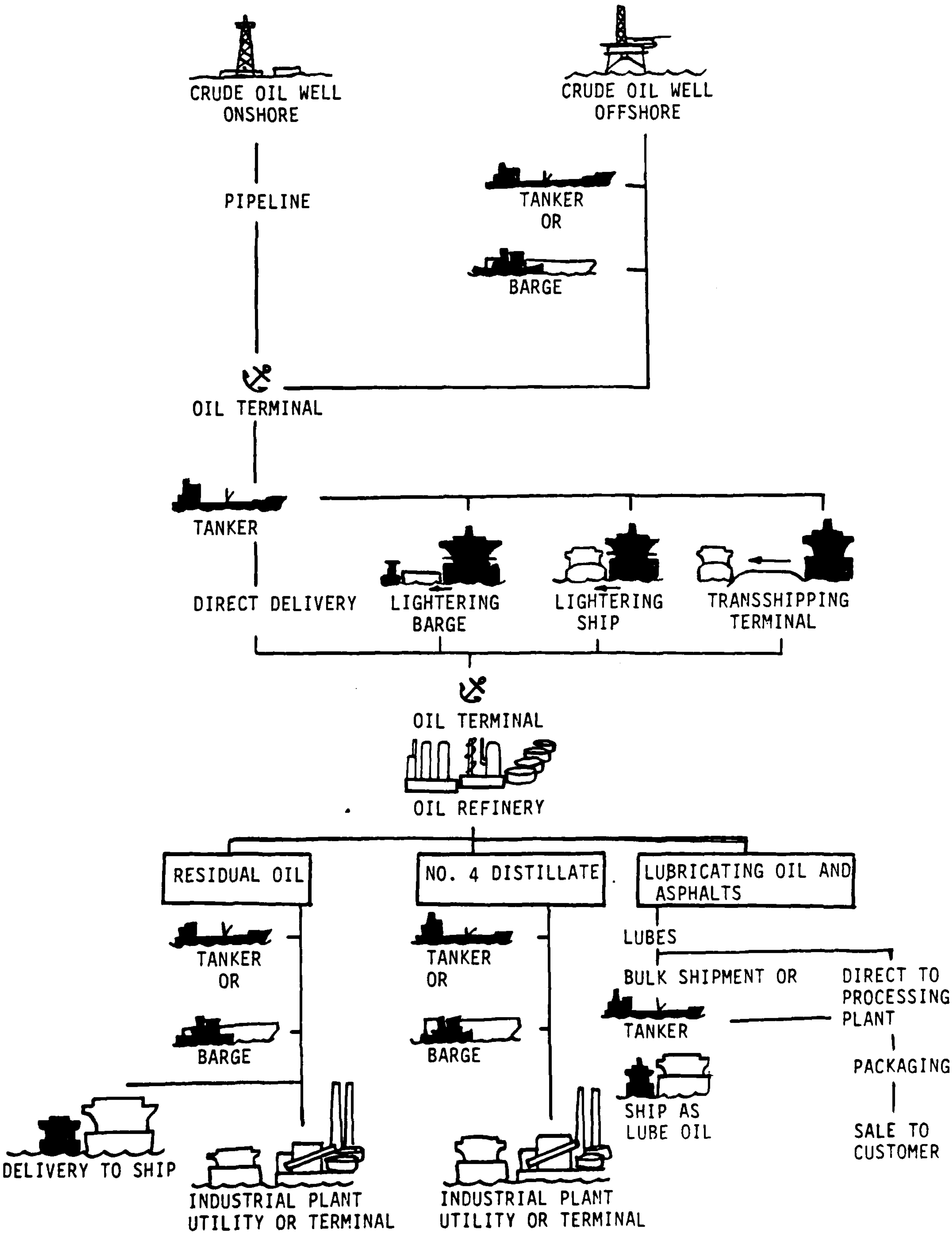
Exhibit V-35 shows graphically that if the United States joined FUND, FUND contributing oil would have amounted to 97 percent of all CRISTAL persistent oil cargoes in 1981, up from 88 percent in 1978.

The basis for the estimates for U.S. contributing oil is summarized for the years 1970-1980 by fuel and type of navigation in Exhibits V-36a-l.

Exhibit V-37 presents a calculation for the U.S. share of FUND contributing persistent oil for the 1970-1980 period, based on FUND membership in 1983.

Exhibit V-1

SCHEMATIC OF TYPICAL PERSISTENT OIL LOGISTICS

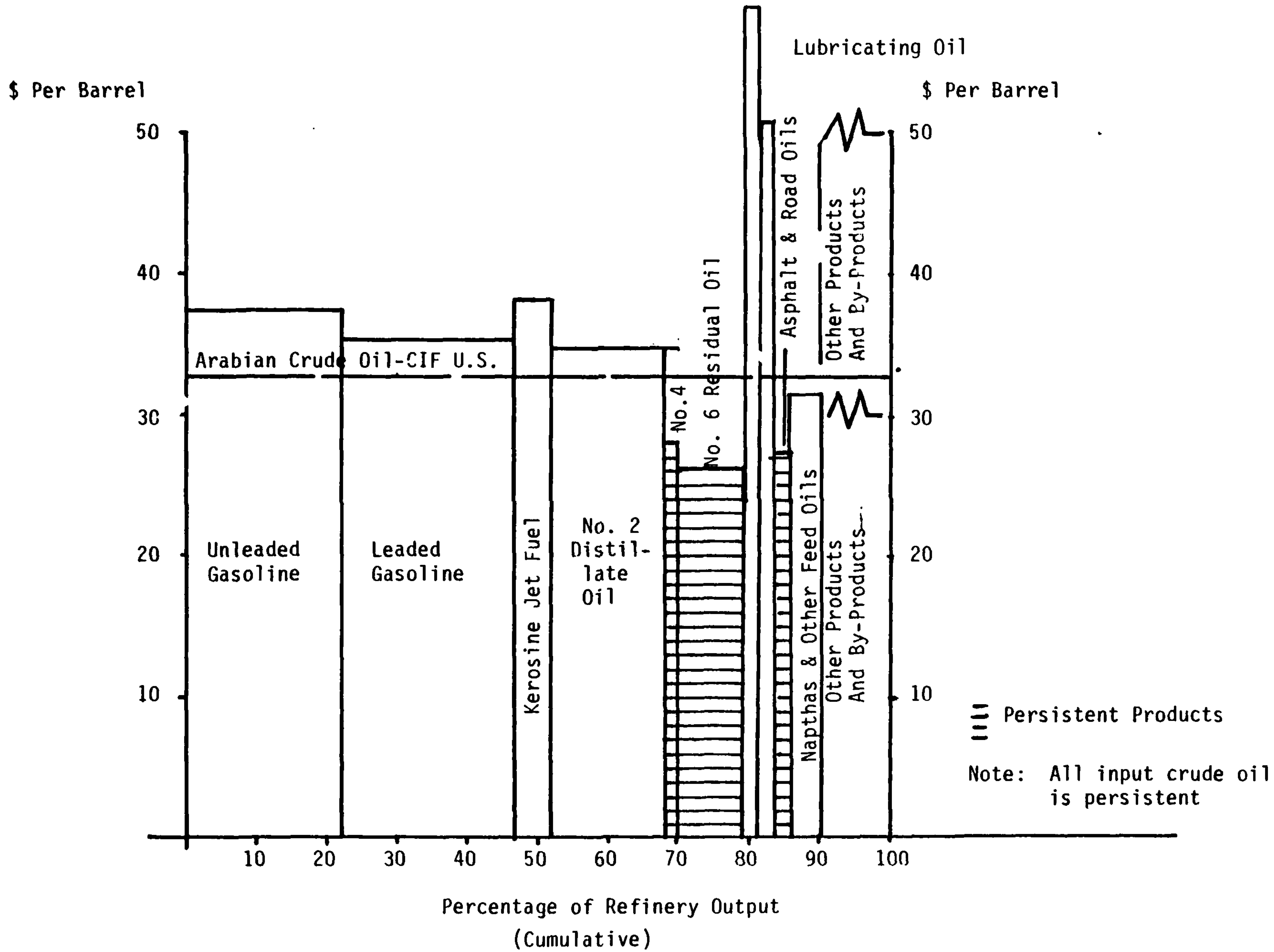


TRUCK

Exhibit V-

PRICE COMPOSITION OF U.S. REFINERY OUTPUT

January, 1983



Source: TBS

Exhibit V-3

UNITED STATES RESIDUAL FUEL OIL CONSUMPTION BY USE BY CONSUMER SECTOR

	Vessel Bunkering	Utility Gas and Electric	Railroad	Oil Company	Industrial	Plant Heating	Military	Miscellaneous	Total
Consumption (thousands of barrels)									
1970	89,850	312,420	2,222	38,318	139,647	185,831	28,704	7,295	804,287
1973	92,415	509,457	1,214	50,562	152,267	192,252	22,892	9,028	1,030,177
1975	96,673	454,935	583	50,487	116,657	154,103	19,068	6,066	898,572
1977	128,966	569,429	329	61,261	167,667	169,484	18,231	4,729	1,120,096
1979	190,543	486,636	245	51,062	165,000[a]	116,488[a]	7,736	16,900	1,034,610
1980	213,131	390,105	665	59,519	163,564	98,034	8,066	4,382	937,466
1981	188,632	325,486	178	51,870	117,024	67,035	7,008	4,795	762,030
Composition (percent)									
1970	11%	39%	-	5%	17%	23%	4%	1%	100%
1973	9	49	-	5	15	19	2	1	100
1975	11	51	-	6	13	17	2	1	100
1977	14	63	-	7	19	19	2	1	100
1979	18	47	-	5	16	11	1	2	100
1980	23	42	-	6	17	10	1	-	100
1981	25	43	-	7	15	9	1	1	100

[a]TBS estimates based on combined 281,488,000 barrel commercial and industrial barrels.

Note: Numbers may not add due to rounding.

Source: U.S. Department of Transportation, Transportation Systems Center, National Transportation Statistics 1970-1977; DOE/EIA Petroleum Supply Annual 1981.

Exhibit V-5

SUMMARY OF WORLD CRUDE OIL SITUATION

1970-1981

(metric tons in millions)

Year	Production[1]	Consumption[1]	Refining Capacity[1]	Refinery Utilization (percent)	Crude Oil International Trade[1]	Crude Oil Seaborne Trade[1]	Percent of World Crude Consumption Seaborne	Crude Oil Tonne-Miles[2] (billions)	Crude Oil[2] (average haul in miles)	U.S. Imports[3]	Crude U.S. Imports as Percent of World Crude Seaborne Trade
1970	2,363	2,284	2,540	90%	-	996	44%	5,598	5,620	75	7.5%
1971	2,495	2,413	2,755	88	1,401	1,070	44	6,555	6,126	96	9.0
1972	2,634	2,592	2,978	87	1,504	1,185	46	7,720	6,515	127	10.7
1973	2,872	2,798	3,213	87	1,695	1,366	49	9,207	6,740	169	12.4
1974	2,879	2,760	3,396	81	1,660	1,361	49	9,661	7,098	181	13.3
1975	2,737	2,725	3,550	77	1,511	1,263	46	8,885	7,035	214	16.9
1976	2,954	2,895	3,708	78	1,708	1,422	49	10,233	7,196	276	19.4
1977	3,067	2,986	3,780	79	1,731	1,475	49	10,472	7,100	345	23.4
1978	3,094	3,083	3,916	79	1,696	1,457	47	9,661	6,631	331	22.4
1979	3,225	3,125	4,002	78	1,760	1,538	49	9,614	6,251	340	22.1
1980	3,079	3,002	4,042	74	1,590	1,362	45	8,385	6,156	274	20.1
1981	2,890	2,902	4,088	71	1,427	1,205	42	7,350	6,100	225	19.6

[1]B.P. Statistical Review of World Energy, 1970 and 1981.
[2]OECD Maritime Transport, 1981.
[3]Exhibit V-18, with translated into metric tons.

Exhibit V-4

COMPOSITION OF USE OF NO. 4 DISTILLATE FUEL OIL BY CONSUMING SECTOR

1981

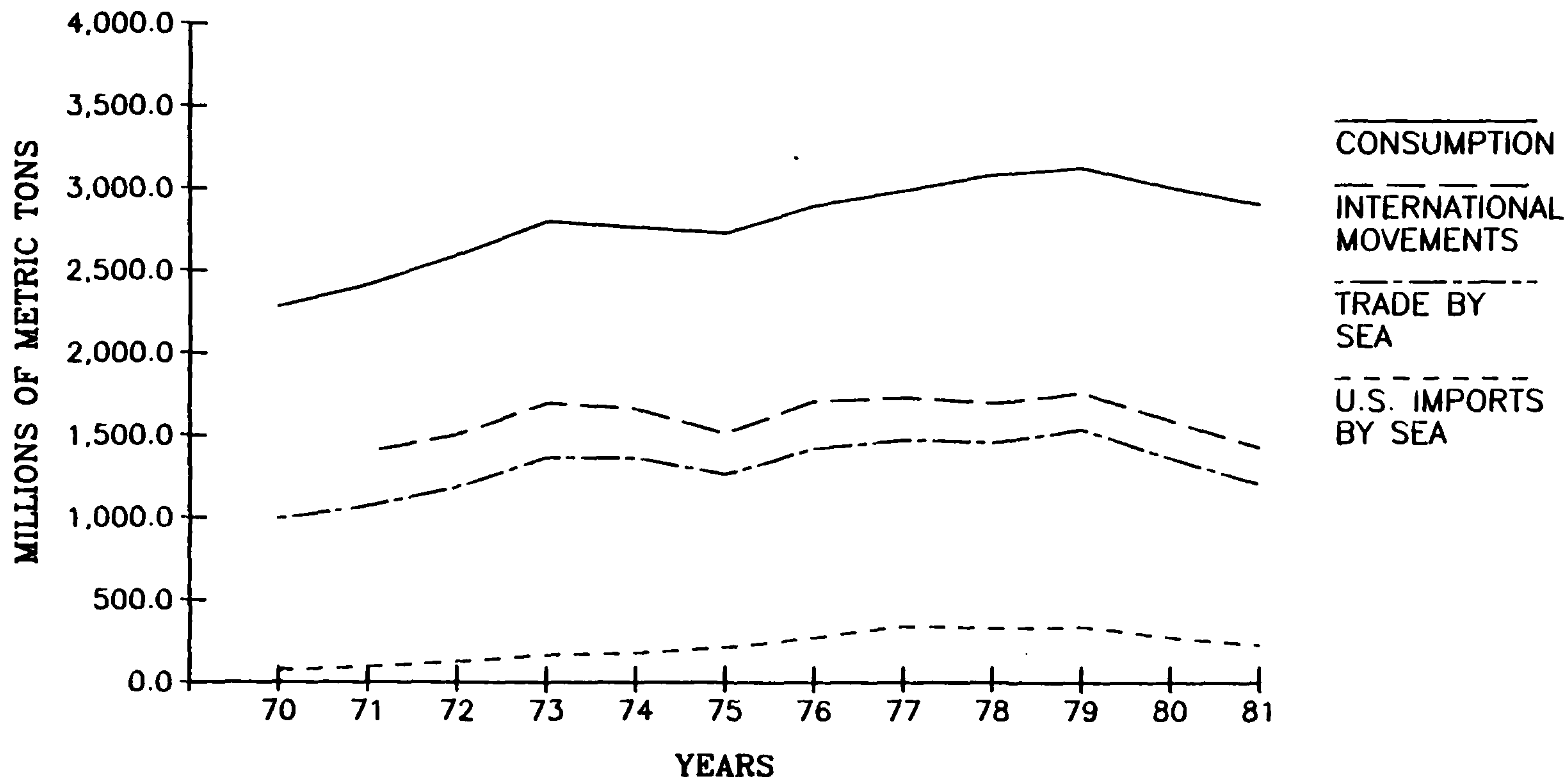
Consuming Sector	Primary Use	Thousand of Barrels	Percent of Total
Demand			
Commercial	Heating of Nonmanufacturing Buildings	10,699	59%
Industrial/ Oil Company	Heating and Power at Manufacturing	6,684	37
Utilities	Electrical Power Generation	721	4
	Total	18,104	100%
Supply			
Blending (estimate)		6,390	
Refining and Imports		11,714	

Source: DOE, Petroleum Supply Annual Report and Cost and Quality of Fuels for Electrtic Utility Plants Report.

EXHIBIT V-6

TRENDS IN WORLD CRUDE OIL CONSUMPTION AND TRANSPORTATION

1970–1981

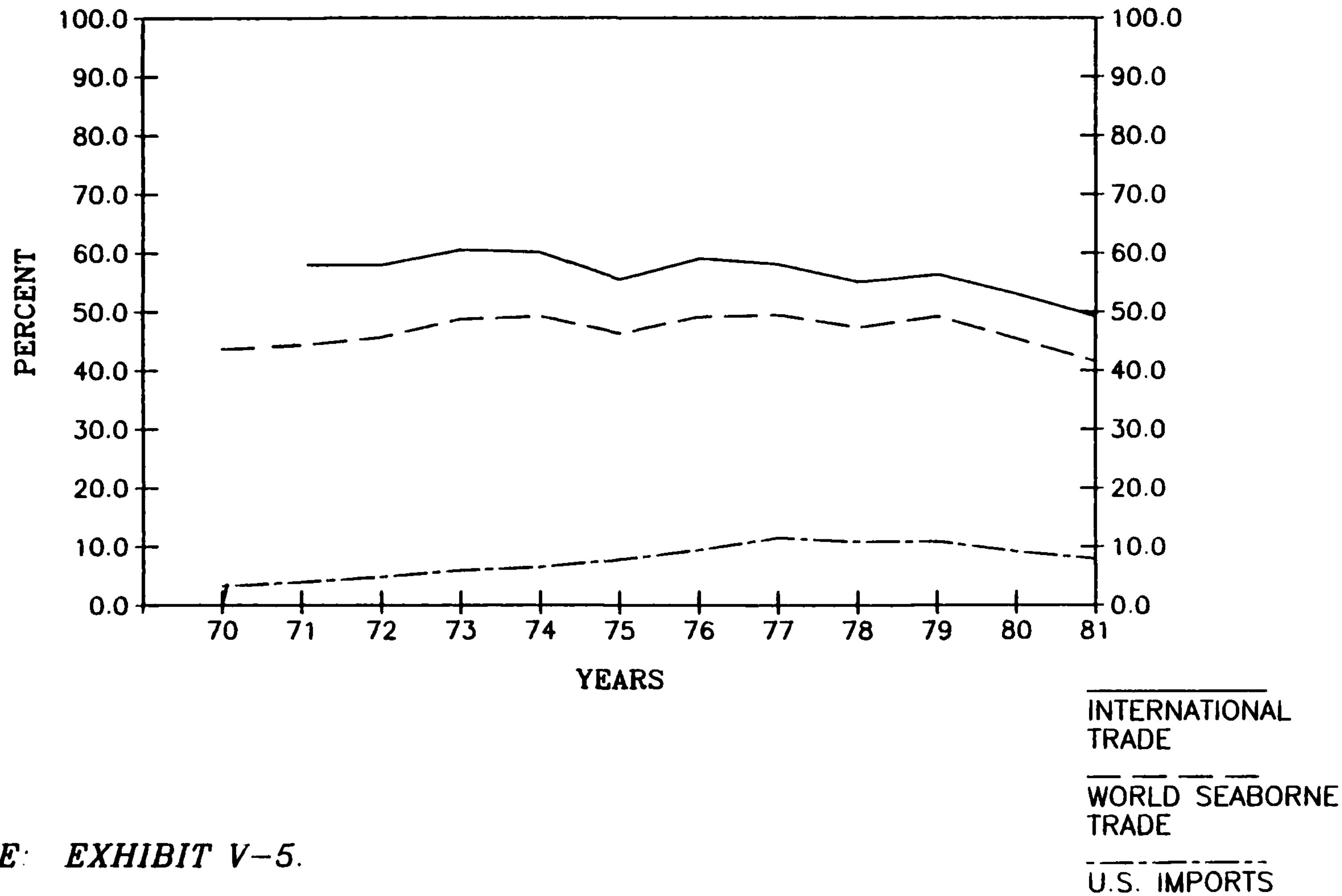


NOTE: EXCLUDES CANADA.
SOURCE: EXHIBIT V-5.

EXHIBIT V-7

COMPOSITION OF WORLD CRUDE OIL CONSUMPTION BY TRANSPORTATION

1970-1981



SOURCE: EXHIBIT V-5.

Exhibit V-8

SUMMARY OF INTERNATIONAL INTEREGIONAL CRUDE OIL
AND PRODUCTS SEABORNE TRANSPORTATION

1970-1981

(metric tons of 2,204 pounds)

Year	Crude Oil Tons (millions)	Products Tons (millions)	Crude Oil Tons-Miles (billions)	Products Tons-Miles (billions)	Average Voyage Lengths		Combined Crude and Product	
					Crude Oil (miles)	Products (miles)	Total Tons (millions)	Percent Product
1970	996	245	5,598	890	5,620	3,633	1,241	20
1971	1,070	247	6,555	900	6,126	3,644	1,317	19
1972	1,185	261	7,720	930	6,515	3,563	1,446	18
1973	1,366	274	9,207	1,010	6,740	3,686	1,640	17
1974	1,361	264	9,661	960	7,100	3,636	1,625	16
1975	1,263	233	8,885	845	7,034	3,626	1,496	16
1976	1,422	260	10,233	950	7,196	3,654	1,682	15
1977	1,475	273	10,472	995	7,100	3,645	1,748	16
1978	1,457	270	9,661	985	6,631	3,648	1,727	16
1979	1,538	279	9,614	1,045	6,251	3,746	1,817	15
1980	1,362	276	8,385	1,020	6,156	3,696	1,638	17
1981	1,205	240	7,350	930	6,100	3,875	1,445	17

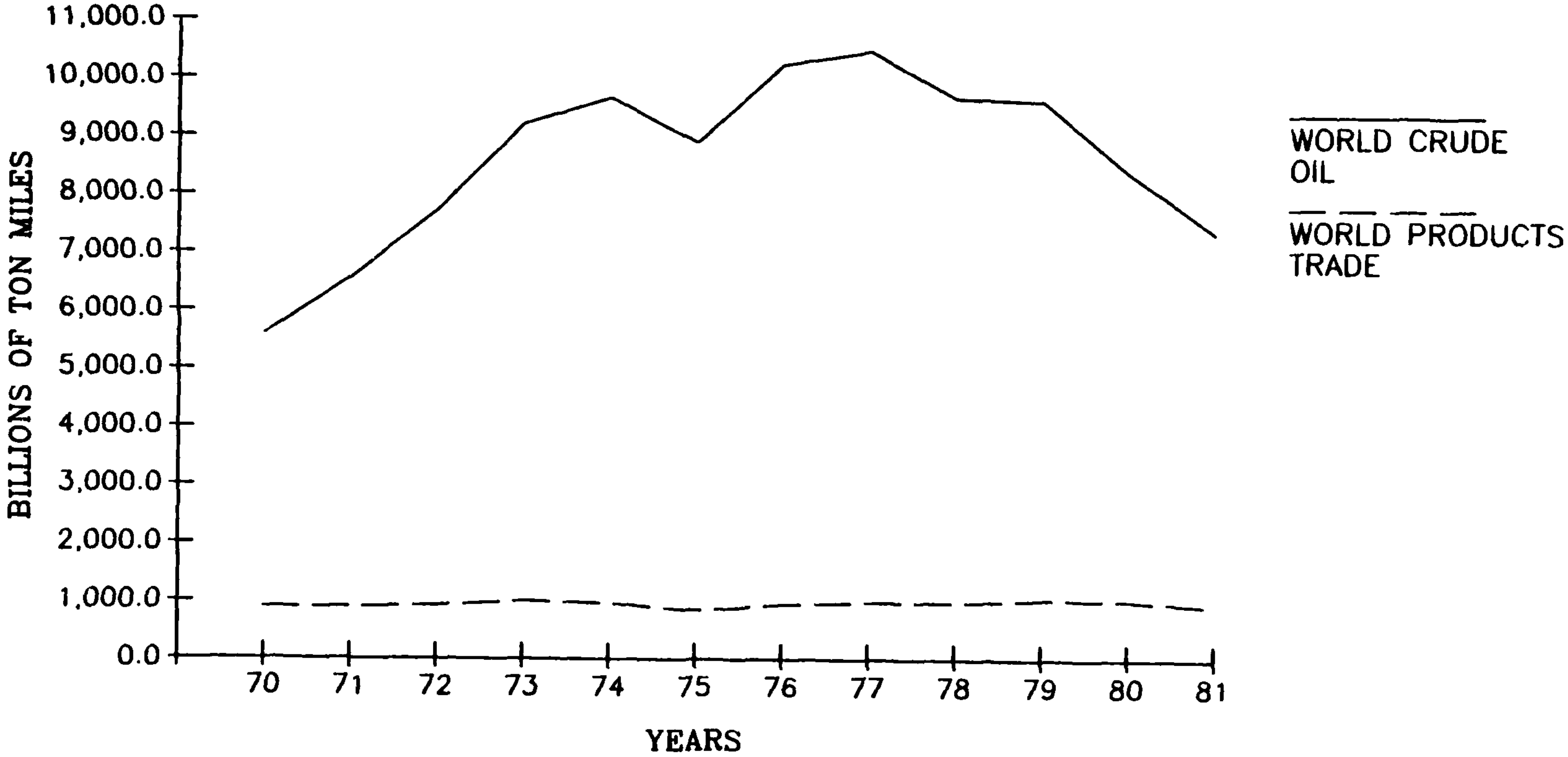
Note: Trade excludes intraregional trades including U.S., Europe, and Far East; and Intranational trades including U.S., U.K., Japan, Indonesia, etc.

Source: Organization for Economic Cooperation and Development, Maritime Statistics, Paris, based on Fearnley's, Review, Oslo, 1981.

EXHIBIT V-9A

SUMMARY OF INTERNATIONAL INTERREGIONAL CRUDE OIL AND PRODUCTS TRADE SEABORNE TRANSPORTATION

1970-1981



SOURCE: EXHIBIT V-8.

Exhibit V-10

MAJOR INTEREGIONAL PETROLEUM TRADES OF
CRUDE OIL AND PETROLEUM PRODUCTS

(millions of metric tons)

Trade	Primary Delivery Route	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Persian Gulf/Red Sea to													
United States	via Cape-Tanker	8.9	19.5	24.3	40.8	52.8	43.1	75.8	100.5	107.0	100.6	74.9	59.7
	Eastbound-Tanker	-	-	-	N.A.	N.A.	13.6	18.8	24.6	6.6	4.0	2.3	1.8
Western Europe	via Cape-Tanker	309.0	380.0	426.5	513.3	505.4	377.9	423.9	381.7	379.9	344.0	288.1	230.4
	E. Med Pipeline-Tanker	N.A.	N.A.	N.A.	N.A.	N.A.	48.0	8.8	15.5	22.2	24.7	34.9	27.9
	Suez-Tanker	C.C.	C.C.	C.C.	C.C.	C.C.	11.0	33.8	38.8	27.2	61.90	39.3	31.4
Latin South America	Cape	12.0	34.8	52.5	47.4	60.8	75.5	85.7	77.7	74.4	74.5	80.4	69.2
Africa	Tanker Direct	20.8	22.0	23.0	26.0	24.1	1.5	24.2	22.2	18.4	22.2	22.0	19.3
Japan	via Indonesia Straits	173.0	194.3	185.8	215.9	201.6	182.4	196.2	203.6	198.1	205.2	176.1	148.2
Southeast Asia	via Indonesia Straits	140.8	51.0	62.5	65.1	63.9	43.9	80.8	78.6	79.6	86.7	86.3	87.3
Australia	Tanker Direct	17.3	15.5	12.8	13.9	13.7	4.0	12.3	11.6	12.1	14.0	10.9	9.1
Eastern Hemisphere	Tanker Direct	21.3	23.0	29.5	38.9	36.0	31.3	12.1	21.5	21.9	44.7	34.3	25.8
Canada	Cape--Tanker	7.5	7.5	12.0	16.0	18.8	26.7	19.5	19.6	13.6	12.5	14.1	9.8
Subtotal		710.6	747.6	828.9	977.3	977.1	902.8	991.9	995.9	961.0	995.0	863.6	719.6
West Africa to													
United States	Tanker Direct	2.5	5.8	13.5	25.2	40.1	42.1	54.3	60.7	48.6	58.9	46.8	35.8
Canada	Tankar Direct	1.8	2.8	3.5	4.4	0.7	1.0	1.5	0.0	0.0	0.0	0.2	0.2
Latin/South America	Tanker Direct	7.8	13.3	13.8	20.3	4.5	9.9	11.5	13.6	15.0	19.5	20.8	14.2
Western Europe	Tanker Direct	44.3	55.0	57.5	50.3	63.0	41.4	42.9	42.2	38.9	50.0	49.0	32.6
Subtotal		56.4	76.9	88.3	100.2	108.3	94.4	110.2	116.5	102.5	128.4	116.8	82.8
North Africa to													
United States	Tanker Direct	3.8	5.0	11.8	17.8	11.4	24.8	43.8	62.9	62.6	64.8	50.8	32.5
Canada	Tanker Direct	0.0	0.0	1.5	2.0	0.7	0.0	1.0	0.0	0.0	1.0	0.3	1.4
Latin/South America	Tanker Direct	2.8	8.9	12.0	8.4	6.1	7.0	7.6	7.4	9.6	6.0	6.7	3.5
Western Europe	Tanker Direct	220.5	150.0	130.0	120.8	91.2	75.9	80.3	82.4	84.5	89.1	71.2	67.0
Subtotal		227.1	163.9	155.3	149.0	109.4	107.7	132.7	152.7	156.7	160.9	129.0	104.4
Carribean/Latin America to													
United States	Tanker Direct	106.3	115.5	121.0	135.1	129.7	113.8	105.0	113.8	114.3	125.5	105.4	96.2
Canada	Tanker Direct	25.3	29.0	24.8	25.1	21.7	13.2	16.2	15.0	14.6	11.9	10.7	14.9
Latin/South America	Tanker Direct	13.0	9.5	8.8	10.9	13.7	6.0	7.0	5.4	18.8	11.5	13.8	10.8
Western Europe	Tanker Direct	26.5	28.8	27.0	17.5	16.3	19.1	17.5	15.1	18.3	14.5	31.1	44.3
Subtotal		171.1	182.8	181.6	188.6	181.4	152.1	145.7	149.3	166.0	163.4	161.0	166.2
Canada to													
United States	via Pipeline	34.3	41.0	53.0	67.0	51.5	39.8	30.0	27.8	22.9	22.6	18.6	21.2
United States to													
Canada	via Pipeline	1.3	1.0	1.5	1.5	1.7	1.0	0.6	1.4	4.8	5.3	5.2	4.6
Other Western Hemisphere	Tanker Direct	1.3	3.5	4.0	3.0	3.3	3.3	3.9	5.8	4.8	12.1	14.8	13.1
Western Europe	Tanker Direct	3.2	4.5	3.5	4.8	4.2	3.6	4.5	4.1	4.5	5.6	8.2	7.2
Subtotal		5.8	9.0	9.0	9.3	9.2	7.9	9.0	14.3	14.1	23.0	28.2	24.9
Western Europe to													
United States	Tanker Direct	10.5	7.3	8.0	13.0	11.7	2.2	7.8	12.4	18.5	17.5	18.1	26.1
Africa	Tanker Direct	4.0	3.0	0.5	3.0	3.7	8.3	4.9	6.5	6.7	7.1	4.2	5.2
Subtotal		14.5	10.3	8.5	16.0	15.4	10.5	12.7	18.9	25.2	24.6	22.3	31.3
Southeast Asia to													
United States	Tanker Direct	3.5	6.5	9.3	11.8	15.6	19.9	28.0	28.3	27.4	25.5	20.1	19.6
Japan	Tanker Direct	30.0	34.3	40.8	54.8	47.1	43.9	51.5	54.2	52.1	58.2	52.5	47.3
Major Seaborne Trades		1,217.7	1,230.3	1,320.2	1,505.5	1,461.8	1,294.3	1,481.1	1,575.7	1,500.2	1,596.8	1,388.3	1,191.5
CRISTAL Contributing Oil		1,240	1,214	1,317	1,446	1,625	1,496	1,682	1,748	1,727	1,817	1,638	1,445
CRISTAL oil as Percent of Major Trades		102%	99%	100%	96%	111%	116%	114%	111%	115%	114%	118%	121%

C.C. = Suez Canal closed.

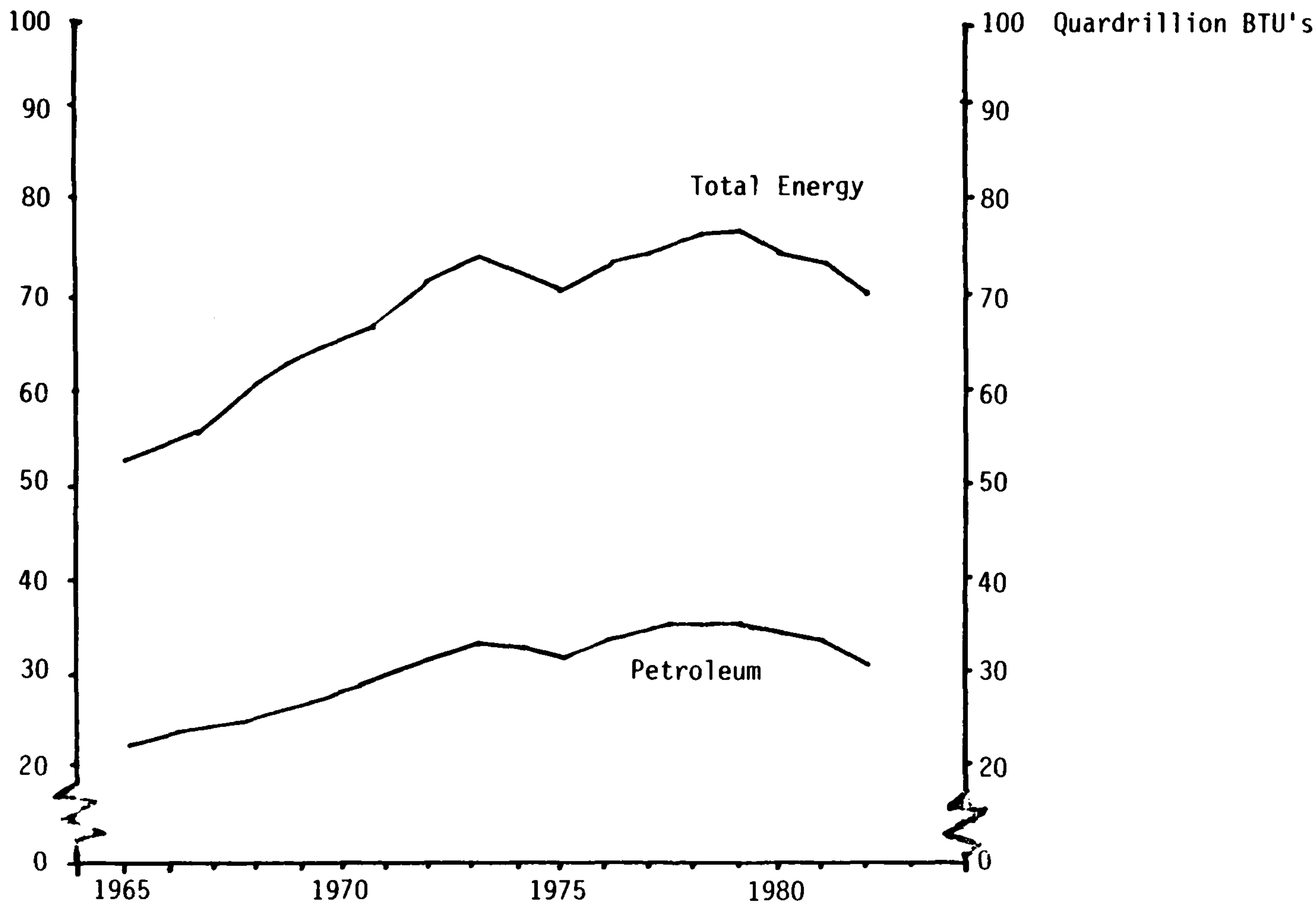
[1]Included in Cape-Tanker tons.

N.A. = Not available.

Source: TBS Analysis of B.P. Petroleum and Fearnley and Egers Statistics.

Exhibit V-11

U.S. ENERGY AND PETROLEUM CONSUMPTION



Source: DOE/EIA: 1980 Annual Report to Congress and Monthly Engergy Review

Exhibit V-12

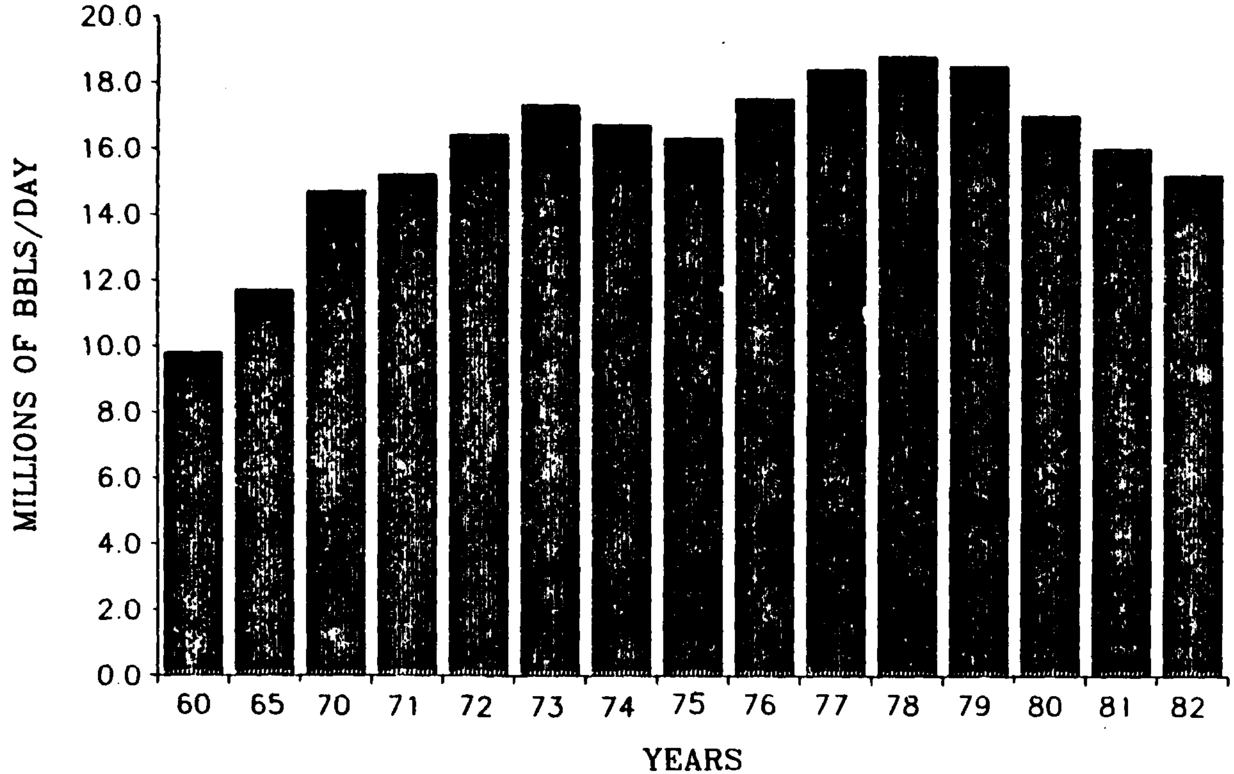
PETROLEUM PRODUCTS SHARE OF U.S. ENERGY CONSUMPTION
BTU BASIS

Source: DOE/EIA: 1980 Annual Report to Congress and Monthly Engergy Reviews

EXHIBIT V-13

U.S TOTAL PETROLEUM PRODUCT SUPPLIED*

1960-1982

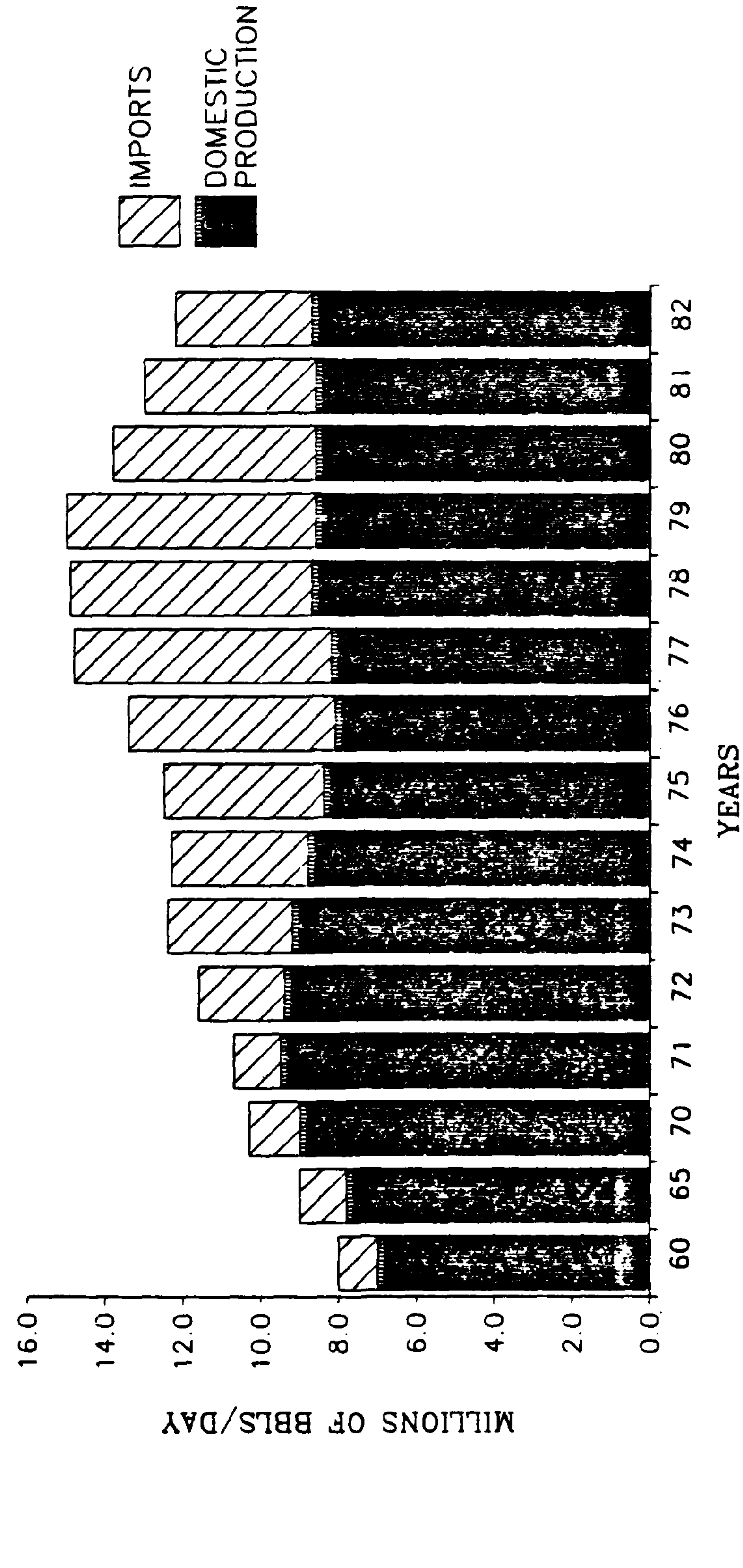


*INCLUDES NATURAL GAS LIQUIDS NOT SUPPLIED TO REFINERIES
SOURCE: DOE/EIA; DE GOLYER AND MACNAUGHTON.

EXHIBIT V-14

U.S. CRUDE OIL SUPPLIES
DOMESTIC PRODUCTION AND IMPORTS*

1960-1982



*DOES NOT INCLUDE NATURAL GAS LIQUIDS NOT SUPPLIED TO REFINERIES
SOURCE: DOE/EIA; DE GOLYER AND MACNAUGHTON

Exhibit V-15

U.S. REFINERY INDUSTRY CRUDE OIL COMPOSITION

1970-1982

(millions of barrels per day)

	Domestic Non-Alaska	Domestic Alaska	Total Domestic	Crude Oil Imports	Strategic Petroleum Reserve (SPR) Receipts[1]	Total[2]	Actual Crude Runs	Percent Imports[2,3]
1970	9.4	0.2	9.6	1.3	-	10.9	10.9	12%
1971	9.2	0.2	9.4	1.7	-	11.1	11.2	15
1972	9.2	0.2	9.4	2.2	-	11.6	11.7	19
1973	9.0	0.2	9.2	3.2	-	12.4	12.4	26
1974	8.6	0.2	8.8	3.5	-	12.3	12.1	29
1975	8.2	0.2	8.4	4.1	-	12.5	12.4	33
1976	7.9	0.2	8.1	5.3	-	13.4	13.4	40
1977	7.7	0.5	8.2	6.6	-	14.8	14.6	45
1978	7.5	1.2	8.7	6.2	0.2	14.9	14.7	42
1979	7.2	1.4	8.6	6.5	0.1	15.1	14.7	44
1980	7.0	1.6	8.6	5.2	-	13.8	13.5	39
1981	7.0	1.6	8.6	4.2	0.3	12.8	12.5	34
1982	7.0	1.7	8.7	3.5	0.2	12.0	11.8	27

[1]SPR commenced in 1977.
[2]Excludes SPR.
[3]Imports as percent of actual crude runs.

Source: DOE EIA Monthly Energy Review (1970-1972 from DOE/Bureau of Mines Crude Petroleum, Petroleum Products and Natural Gas Liquids: Final Summary--annual).

Exhibit V-16

IMPORTS OF PETROLEUM PRODUCTS INTO THE UNITED STATES

1970-1982

(millions of barrels per day)

	Gasoline	Distillate	Jet Fuel	Residual	All Other Products	Total Import
1970	0.1	0.2	0.2	1.5	0.1	2.1
1971	0.1	0.2	0.2	1.6	0.2	2.3
1972	0.1	0.2	0.2	1.8	0.2	2.5
1973	0.1	0.4	0.2	1.9	0.4	3.0
1974	0.2	0.3	0.2	1.6	0.3	2.6
1975	0.2	0.2	0.1	1.2	0.3	2.0
1976	0.1	0.2	0.1	1.4	0.2	2.0
1977	0.2	0.3	0.1	1.4	0.2	2.2
1978	0.2	0.2	0.1	1.4	0.1	2.0
1979	0.2	0.2	0.1	1.2	0.2	1.9
1980	0.1	0.1	0.1	0.9	0.4	1.6
1981	0.2	0.2	-	0.8	0.3	1.5
1982	0.2	0.1	-	0.8	0.3	1.4

Source: TBS analysis of DOE/EIA data.

Exhibit V-17

NATIONAL RESIDUAL FUEL OIL SUPPLY

1970-1982

(millions of barrels per day)

	U.S. Refinery Runs	Total Residual Fuel Produced	Imports	Exports	Residual Production as Percent of U.S. Crude Runs	Total Residual Oil Supplied to U.S.	Percent of Residual Supply from Imports
1970	10.9	0.7	1.5	-	6%	2.2	68%
1971	11.2	0.8	1.6	-	7	2.4	67
1972	11.7	0.8	1.8	-	7	2.6	69
1973	12.4	1.0	1.9	-	8	2.9	66
1974	12.1	1.1	1.6	-	9	2.7	59
1975	12.4	1.2	1.2	-	10	2.4	50
1976	13.4	1.4	1.4	-	10	2.8	50
1977	14.6	1.8	1.4	-	9	3.2	44
1978	14.7	1.7	1.4	-	10	3.1	45
1979	14.7	1.7	1.2	-	8	2.9	41
1980	13.5	1.6	0.9	-	12	2.5	36
1981	12.5	1.3	0.8	0.1	10	2.1	38
1982	11.8	1.1	0.8	0.2	9	1.7	41

Source: DOE EIA Monthly Energy Review and 1970-1972 from DOE/Bureau of Mines Crude Petroleum, Petroleum Products and Natural Gas Liquids Final Summary—annual.

Exhibit V-18

IMPORTS OF PERSISTENT PETROLEUM COMMODITIES

(thousands of barrels per day)

	Crude Oil[1]	Residual Oil Imports	All Distillate Oils (most nonpersistent) Imports	No. 4 Distillate Oil Imports	Asphalt, Tar, Road Oil Imports	Lube Oils
1970	1,438	1,528	147	70	17	1
1971	1,841	1,583	153	67	20	0
1972	2,434	1,746	182	86	25	2
1973	3,244	1,853	392	96	14	5
1974	3,477	1,587	289	59	15	4
1975	4,105	1,223	155	41	11	4
1976	5,287	1,413	146	28	4	9
1977	6,615	1,359	250	33	2	8
1978	6,356	1,355	173	16	4	9
1979	6,519	1,151	193	12	4	9
1980	5,263	939	142	3	4	7
1981	4,396	800	173	6	4	8
1982	3,461	758	93	N.A.	N.A.	N.A.

Note: Shipments from the U.S. Virgin Islands are included as imports in this data.
N.A. = Not available.

[1]Includes lease condensate, Strategic Petroleum Reserve, and unfinished oil.

Source: U.S. Department of Energy Monthly Energy Reviews and Petroleum Supply Annuals; TBS analysis of Bureau of Mines Crude Oil, Petroleum Products, and Natural Gas Liquids annuals.

Exhibit V-19

COASTAL DISTRIBUTION OF U.S. PERSISTENT OIL IMPORTS

CALENDAR YEAR 1981

(thousands of barrels)

	Atlantic	Gulf	Pacific	U.S. Total
Thousands of Barrels				
Crude	406,466[a]	1,035,265[a]	110,126	1,551,857
Unfinished Oils	18,096	19,838	2,858	40,792
Residual Oil	260,156	22,647	9,266	292,069
No. 4 Distillate	2,079	-	-	2,079
Lubricants	1,940	946	184	3,069
Asphalts	1,272	155	--	1,427
	690,009	1,078,851	122,434	1,891,294
Percent Composition of Imports (barrel basis)				
Crude	22%	55%	6%	82%
Unfinished Oils	1	1	-	2
Residual Oil	14	1	1	15
No. 4 Distillate	-	-	-	-
Lubricants	-	-	-	-
Asphalts	-	-	-	-
	36%	57%	6%	100%

[a]PADD II--Midwest imports assigned to PADD III except for Canada.
[2]Virgin Island shipments of residual oil and fuel oil are counted and imports by the Department of Energy and are presented in this way.
[3]Excludes Canadian imports.

Source: DOE Petroleum Supply Annual, 1981 Table 18 and TBS analysis.

Exhibit V-20

EXPORTS OF PERSISTENT PETROLEUM COMMODITIES

(thousands of barrels per day)

	Crude Oil	Residual Oil	All Distillate Oils		Asphalt, Tar, Road Oil	Lube Oils
			Total (most non-persistent)	No. 4 Distillate Oil		
1970	4	54	2	0	1	44
1971	1	36	8	0	1	43
1972	1	33	3	0	1	41
1973	1	23	9	0	1	35
1974	3	14	2	0	1	33
1975	6	15	1	0	1	25
1976	8	12	1	0	11	26
1977	0	6	1	0	1	26
1978	0	13	3	0	0	27
1979	0	8	3	0	1	23
1980	0	34	3	0	1	24
1981	0	1	0	0	5	14

Note: U.S. shipments of crude to Panama for transshipping to the United States and shipments of crude from the United States to the U.S. Virgin Islands are excluded.

Source: U.S. Department of Energy Monthly Energy Reviews and Petroleum Supply Annuals; TBS analysis of Bureau of Mines Crude Oil, Petroleum and Natural Gas Liquids annuals.

Exhibit V-21

VOLUME AND COMPOSITION OF MAJOR SOURCES OF PERSISTENT OIL IMPORTS TO THE U.S. MAINLAND

	Crude Oil				Residual Oil			No. 4 Distillate Oil	
	1970	1975	1979	1981	1970	1975	1981	1970	Typical Delivery
Millions of Barrels									
Saudi Arabia	14.5	256.0	491.5	406.1	0.5	-	0.1	-	Direct or Transshipping/Lightening from large to small tankers
Nigeria	17.5	272.3	490.1	223.0	0.6	5.6	3.1	-	Direct Delivery
Mexico	0.0	25.6	158.9	171.4	6.5	0.1	11.5	-	Direct Delivery and Carribean Transshipping
United Kingdom	0.0	0.0	0.0	134.8	-	2.9	0.5	-	Direct Delivery
Indonesia	25.7	138.3	133.5	116.1	-	3.1	11.3	-	Direct Delivery
Libya	17.2	81.4	234.2	-	0.1	3.1	0.4	-	Direct Delivery
Algeria	2.1	96.5	222.0	95.2	0.6	4.9	15.4	-	Direct Delivery
Canada	245.3	219.2	99.1	59.9	5.7	23.1	14.2	0.5	Pipeline
Venezuela	98.0	144.2	106.8	53.6	211.2	88.2	78.7	13.6	Direct Delivery
Norway	-	4.4	11.1	41.5	-	1.3	0.1	-	Direct Delivery
Trinidad/Tobago	0.3	42.1	45.0	37.2	61.6	28.3	7.1	3.7	Direct Delivery
Netherlands Antilles	-	-	-	-	135.0	96.3	61.2	5.2	Direct Delivery
Virgin Islands	-	-	-	-	52.5	94.7	52.9	0.4	Direct Delivery
Bahamas	-	-	-	-	10.8	45.3	12.5	-	Direct Delivery
Iran	12.2	101.6	108.3	-	0.3	0.2	-	-	Direct or Transshipping/Lightening from large to small tankers
All Others	50.5	116.6	193.3	150.5	72.4	38.8	23.0	2.2	Various Routes
Total	483.3	1,498.2	2,293.8	1,604.7	557.8	435.9	292.1	25.6	
Percent of Total									
Saudi Arabia	3.0	17.1	21.4	10.4	0.1	0.0	0.0		
Nigeria	3.6	18.2	21.4	5.7	0.1	1.3	1.0		
Mexico	0.0	1.7	6.9	10.7	1.1	0.0	3.9		
United Kingdom	0.0	0.0	0.0	8.4	0.0	0.7	0.2		
Indonesia	5.3	9.2	5.8	7.2	0.0	0.7	0.4		
Libya	3.6	5.4	10.2	0.0	0.0	0.7	0.1		
Algeria	0.4	6.4	9.7	5.9	0.1	1.1	5.3		
Canada	50.8	14.6	4.3	3.7	1.0	5.2	4.9	2.0	
Venezuela	20.3	9.6	4.7	3.3	37.9	20.2	26.9	53.1	
Norway	0.0	0.3	0.5	2.5	0.0	0.3	0.0	-	
Trinidad/Tobago	0.0	2.8	2.0	2.3	11.0	6.4	2.4	14.5	
Netherlands Antilles	0.0	0.0	0.0	0.0	24.2	22.1	21.0	20.3	
Virgin Islands	0.0	0.0	0.0	0.0	9.4	21.7	18.1	1.6	
Bahamas	0.0	0.0	0.0	0.0	1.9	10.4	4.3	-	
Iran	2.5	6.8	4.7	0.0	0.1	0.0	0.0	-	
All Others	10.4	7.8	8.4	9.4	13.0	8.9	7.9	8.6	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Note: Virgin Islands is a U.S. Territory.

Source: TBS analysis of Bureau of Mines, and DOE/EIA Annual Petroleum Supply and Demand Data.

Exhibit V-22

SELECTED MAJOR U.S. DOMESTIC PERSISTENT OIL TRADES

Calendar Year 1981

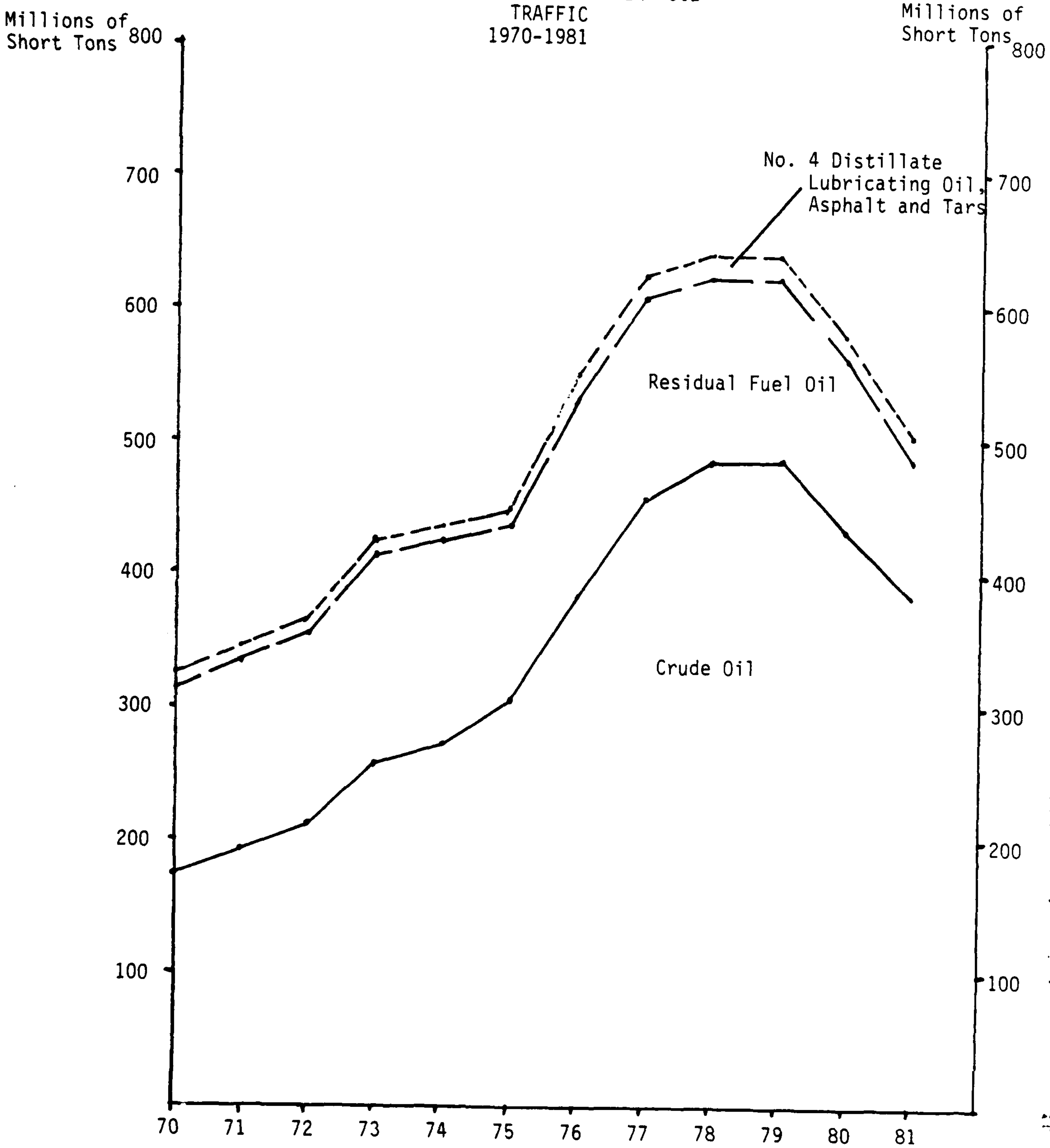
From	To	Metric Tons Per Year	Comment
<u>Crude Oil/Unfinished Oil</u>			
Valdez, Alaska	Pacific Coast	42,786,111	Alaskan crude oil
Valdez, Alaska	Panama Transshipping	27,425,694	
Panama Transshipping	Gulf Coast	19,998,958*	Via Canal (Panama Pipeline in 1983)
Panama Transshipping	Atlantic Coast	3,573,958*	Via Canal (Panama Pipeline in 1983)
Panama Transshipping	Puerto Rico/Virgin Islands	2,382,638*	Via Canal (Panama Pipeline in 1983)
Valdez, Alaska	Hawaii	1,723,611	
Alaska, South Slope	Pacific Coast	4,309,027	
Gulf Coast	Atlantic	734,155	
Delaware Bay	Delaware River	3,993,892	Tankers via Panama
New York Bay	New Jersey Ports	1,353,491	Tanker to barge lightening
Atlantic Coast	Gulf Coast	73,027	Tanker to barge lightening
Valdez, Alaska	U.S. Virgin Islands	6,387,500	Foreign-flag tankers used
Subtotal		88,786,508	
<u>Residual Fuel</u>			
Atlantic Coast	Atlantic Coast	10,734,798 (1980)	
Gulf Coast	Atlantic Coast	9,471,000	
Gulf Coast	Gulf Coast	6,064,268 (1980)	
Pacific Coast	Atlantic Coast	477,000	
Pacific Coast	Pacific Coast	10,221,254 (1980)	
New York Harbor	New York Harbor	17,638,841	
Delaware River	Delaware River	8,672,075	Tanker to barge lightening
Subtotal		63,279,236	
			Tanker to barge lightening
<u>No. 4 Distillate Fuel Oil</u>			
Gulf Ports	Atlantic Ports	659,000	
<u>Asphalt, Tar Pitch</u>			
Gulf	Gulf	271,103 (1980)	
Atlantic	Atlantic	991,899 (1980)	
Pacific	Pacific	302,031 (1980)	
Gulf	Atlantic	552,000	
Subtotal		2,117,033	
<u>Lubricating Oils</u>			
Gulf	Atlantic	1,303,000	
Gulf	Pacific	319,000	
Atlantic	Gulf	199,000	
Subtotal		1,821,000	
Total Above		156,662,777	

*These are transshipment flows via Panama.

Source: TBS anaylsis of DOE/EIA <u>Petroleum Supply Annual</u> data, and U.S. Army Corps of Engineers and Maritime Administration data.

Exhibit V-23

TRENDS IN U.S. PERSISTENT OIL TRAFFIC 1970-1981

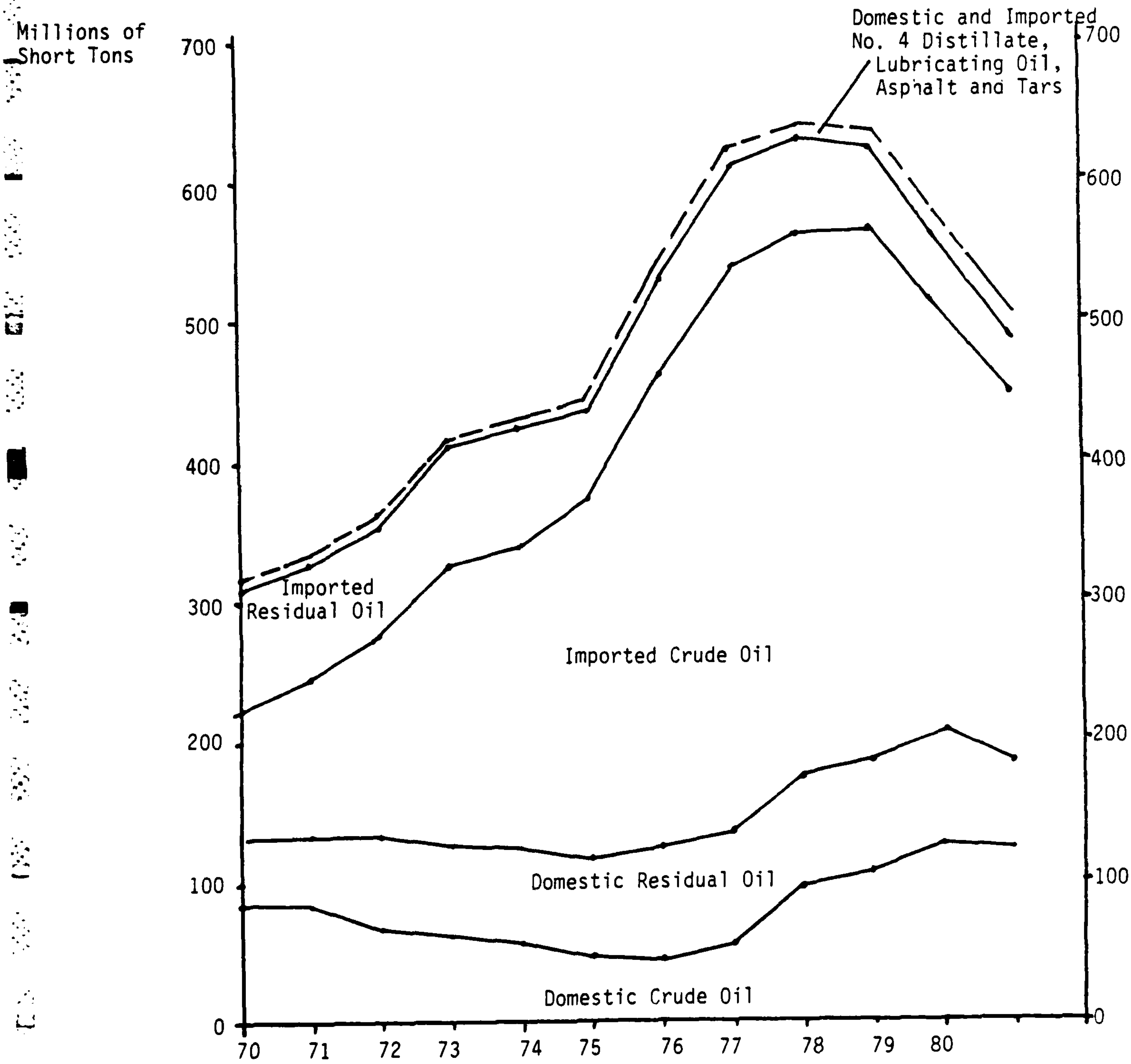


Source: Exhibit V-36

Exhibit V-24

COMPOSITION OF U.S. PERSISTENT
OIL TRADES

1970-1981



Source: Exhibit V-36

Exhibit V-25

SEAGOING TANK VESSELS
IN THE U.S. COMMERCIAL FLEET

	1970		1981	
	Atlantic, Gulf, Pacific	Great Lakes	Atlantic, Gulf, Pacific	Great Lakes
Tankers				
Number	359	19	318	12
Deadweight	7,548,254	64,621	14,142,688	19,746
Average Size	21,026	3,401	44,473	1,645
Tank Barges				
Number	581	23	688	33
Deadweight	1,358,234	49,639	2,832,885	60,627
Average Size	2,338	2,158	4,118	1,837

Source: TBS analysis of U.S. Army Corps of Engineers Summary of United States Flag Passenger and Cargo Vessels Operating or Available for Operation.

Exhibit V-26

DESCRIPTION OF U.S. SEAGOING VESSEL TRADES IN PERSISTENT OILS

	Crude	Residual	Distillates	Asphalt, Tar, and Pitch	Lube Oil, Grease
	Receipts into the United States from Foreign Waters				
Imports					
From	Foreign Ports	Foreign Refineries and Terminals	Foreign Refineries and Terminals	Foreign Refineries	Foreign Refineries
To	Refineries and Terminals	Utilities, Industries, and Terminals	Terminals, Utilities, and Industries	Terminals	Refineries
Ships	U.S. and Foreign-Flag	U.S. and Foreign Flag	U.S. and Foreign Flag	U.S. and Foreign Flag	U.S. and Foreign Flag
Barges	Rare	Rare	Rare	Rare	Rare
	Receipts at Coastal Ports from Other Coastal Ports				
Coastwise					
From	Alaska, California Terminals and Refineries	Refineries	Refineries and Terminals	Refineries	Refineries
To	Refineries and Terminals	Utilities, Industries, and Terminals	Terminals, Utilities, and Industries	Terminals	Refineries and Terminals
Ships	Frequent	Frequent	Frequent	Frequent	Frequent
Barges	Very Few	Some	Frequent	Frequent	Frequent
	Receipts on the Great Lakes from Great Lakes Ports				
Lakewise					
From	Terminals	Refineries	Refineries and Terminals	Refineries	Refineries and Terminals
To	Very Rare	Utilities and Industries	Terminals and Industries	Terminals	Terminals
Ships	-	Frequent	Frequent	Frequent	Frequent
Barges	-	Some	Some	Some	Some
	Receipts on Movements within a River or Sound				
Internal					
From	Refineries and Ships	Refineries, Ships and Terminals	Refineries and Terminals	Refineries	Refineries
To	Refineries	Refineries, Termnals, Utilities	Terminals, Utilities, and Industries	Terminals	Terminals
Ships	Rare	Rare	Rare	Rare	Rare
Barges	Frequent	Frequent	Frequent	Frequent	Frequent
	Receipts from within the Same Harbor or Waterway				
Local					
From	Refineries and Ships	Refineries, Ships, and Terminals	Refineries and Terminals	Refineries	Refineries
To	Refineries	Refineries, Terminals, Utilities and Industries and ships as Bunkers	Terminals, Utilities, and Industries	Terminals	Terminals
Ships	Rare	Rare	Rare	Rare	Frequent
Barges	Frequent	Frequent	Frequent	Frequent	Frequent

Exhibit V-27

TANKER AND TANK BARGE SHARES OF TRAFFIC IN SEAGOING VESSELS

1980

	Crude Oil	Residual Fuel Oil	No. 4 Distillate	Asphalt, Tar, Pitch	Lube Oil, Grease
Tanker Shares of Commodity Traffic					
Imports	99%	99%	99%	99%	99%
Coastwise	99	80	68	26	91
Lakewise	-	18	70	38	0
Internal and Local	23	41	12	8	25
Tank Barge Shares of Commodity Traffic					
Imports	1%	1%	1%	1%	1%
Coastwise	1	20	32	74	9
Lakewise	-	82	30	62	100
Internal and Local	77	96	88	92	75

Source: TBS analysis of U.S. Army Corps of Engineers Waterborne Commerce Statistical Center data for crude, residual, asphalt, tar pitch, lube oil, and grease. TBS estimate for No. 4 distillate.

Exhibit V-28

COMPARISON OF FUND AND CRISTAL

	FUND		CRISTAL	
	Contribution Call	Liability Coverage	Assessment Call	Liability Coverage
Crude Oil (all types)	X	X	X	X
Residual Oil	X	X	X	X
No. 4 Distillate Oil	X	X	X	X
Tar, Asphalt, Road Oil	-	X	-	X
Lubricating Oils	-	X	-	X
Whale Oil	-	X	-	-
Imports	X	X	X	X
Coastwise	X	X	X	X
Lakewise	X	X	X	X
River in Seagoing	-	X	-	X
Internal/Local/Harbor	-	X	-	X
Small Ship, Minimum	None--All Seagoing Vessels Carrying Oil		Vessel Sailing in Service For its Seagoing Loadline	
Seagoing/Loadline Barges		X		X
Nonseagoing Barges		-		-
Transshipping Cargos	X	X	-	X
Minimum to be Called	"Per Person" 150,000 metric tons		Not Applicable	

Source: TBS Analysis of FUND and CRISTAL documents.

Exhibit V-29

COMPARISON OF KEY PERSISTENT OIL VOLUMES

	CRISTAL		World Interregional Crude and Products Trade[2] (millions of metric tons)	FUND Contributing Oil	
	Millions of Barrels	Millions of Metric Tons[1]		Millions of Metric Tons	Percent of CRISTAL
1971	9,100	1,300	1,317	-	-
1972	9,600	1,300	1,446	-	-
1973	10,300	1,471	1,640	-	-
1974	10,500	1,500	1,625	-	-
1975	9,700	1,386	1,496	-	-
1976	10,700	1,529	1,682	-	-
1977	12,000	1,714	1,748	-	-
1978	12,100	1,729	1,727	934	54%
1979	12,300	1,757	1,817	965	55
1980	11,500	1,643	1,638	873	53
1981	9,900	1,414	1,445	915	65

[1]Calculated on basis of 90 percent crude oil, 10 percent residual fuel oil. Weighted barrels per metric ton is 7.0. CRISTAL assessment call oil includes intraregional and intracountry movements.

[2]Source: Exhibit V-8. This traffic includes light products and excludes intraregional and intracountry trading. It is useful as a general indication of the coverage of persistent oil trade by CRISTAL.

Exhibit V-30

CONTRIBUTING OIL RECEIVED BY FUND
MEMBER COUNTRIES, 1978-1981

Member Country	1978		1979		1980		1981	
	Millions of Metric Tons	Percent of Total	Millions of Metric Tons	Percent of Total	Millions of Metric Tons	Percent of Total	Millions of Metric Tons	Percent of Total
Japan	349.9	37.5	362.8	37.6	326.0	37.4	286.01	31.3
Italy	166.5	17.8	170.6	17.7	143.7	16.5	142.04	15.5
France	135.4	14.5	151.1	15.7	135.8	15.6	113.60	12.4
Netherlands	N.M.	-	N.M.	-	N.M.	-	89.11	9.7
United Kingdom	101.3	10.8	102.3	10.6	83.6	9.6	75.29	8.2
Hong Kong	3.9	0.4	3.9	0.4	4.0	0.5	4.94	0.5
Spain	N.M.	-	N.M.	-	N.M.	-	53.9	5.9
Germany, Fed. Republic	65.3	7.0	59.5	6.2	33.7	6.2	48.3	5.3
Sweden	23.4	2.5	27.1	2.8	35.9	4.1	21.35	2.3
Bahamas	33.8	3.6	34.3	3.6	24.3	2.8	20.04	2.2
Indonesia	17.3	1.9	17.1	1.8	17.1[a]	2.0	14.71	1.6
Finland	N.M.	-	N.M.	-	14.2	1.6	13.28	1.5
Yugoslavia	9.5	0.1	10.9	1.1	10.5	1.2	9.73	1.1
Denmark	12.7	0.4	13.1	1.4	10.3	1.2	8.49	0.9
Norway	8.6	0.9	8.7	0.9	8.4	1.0	7.76	0.8
Tunisia	1.6	0.2	1.5	0.2	2.2	0.3	2.27	0.2
Gabon	N.M.	-	N.M.	-	N.M.	-	1.19	0.1
Ghana	1.8	0.2	1.1	0.1	1.1[a]	0.1	1.13	0.1
Liberia	0.2	0.0	0.6	0.1	0.6[a]	0.1	0.43	0.1
Algeria	0.6	0.0	0.4	0.0	0.3	0.0	0.35	0.0
Syria	2.0	0.0	nil	0.0	0.3	0.0	0.28[b]	0.0
Papua New Guinea	N.M.	0.0	0.2	0.0	0.2	0.0	0.20	0.0
Iceland	N.M.	0.0	U.L.	0.0	U.L.	0.0	U.L.	0.0
Monaco	U.L.	0.0	U.L.	0.0	U.L.	0.0	U.L.	0.0
Kuwait	N.M.	0.0	N.M.	0.0	U.L.	0.0	U.L.	0.0
Maldives	N.M.	0.0	N.M.	0.0	U.L.	0.0	U.L.	0.0
Tuvalu	U.L.	0.0	U.L.	0.0	U.L.	0.0	U.L.	0.0
Total	933.8	100.0	965.2	100.0	872.8	100.0	915.2	100.0

N.M. = Non member.

U.L. = Under the 150,000 ton minimum.

[a]No report for 1980; figure represents oil receipts reported for 1979.
[b]1980 data.

Source: International Oil Pollution Compensation Fund; TBS estimate.

Exhibit V-31

FOR MAJOR FUND MEMBERS

1978-1980/1981

(millions of metric tons)

	Imports[1]			Fund Contributing Oil	Contributing Ratio[2]
	Crude Oil	Residual Oil	Total		(imports: contributing oil)
Japan					
1978	235.0	5.6	240.6	349.9	1:1.43
1979	239.1	6.8	245.9	362.8	1:1.48
1980	229.6	7.2	236.8	326.0	1:1.38
1981	196.8	6.2	203.0	286.0	1:1.41
Italy					
1978	110.8	3.3	114.1	166.5	1:1.46
1979	114.9	3.9	118.8	170.6	1:1.44
1980	88.7	8.9	97.6	143.7	1:1.47
1981	90.8	10.2	101.0	142.0	1:1.41
France					
1978	115.6	2.1	117.7	135.4	1:1.15
1979	127.2	3.6	130.8	151.1	1:1.16
1980	109.5	3.4	112.9	135.8	1:1.20
1981	95.0	2.5	97.5	113.6	1:1.17
United Kingdom					
1978	68.1	3.9	72.0	101.3	1:1.41
1979	60.4	5.6	66.0	102.3	1:1.55
1980	43.3	2.8	46.1	83.6	1:1.81
1981	36.8	2.9	39.7	75.3	1:1.90
Spain					
1978	46.8	0.7	47.5		
1979	47.1	0.5	47.6		
1980	47.4	0.9	48.3		
1981	47.8	0.9	48.7	53.9	1:1.12
Germany					
1978	98.3	6.1	104.4	65.3	1:.63
1979	110.9	4.5	115.4	59.5	1:.52
1980	97.9	4.6	102.5	54.3	1:.53
1981	79.6	6.6	86.2	48.3	1:.56
Sweden					
1978	16.3	5.1	22.4	23.4	1:1.04
1979	16.5	7.5	24.0	27.1	1:1.13
1980	17.9	5.2	23.1	35.9	1:1.55
1981	15.2	4.1	19.3	21.4	1:1.11
Netherlands					
1978	99.1	20.5	119.6		
1979	59.4	3.9	63.3		
1980	49.7	7.5	57.2	80.0	1:1.40
1981	38.7	9.1	47.8	89.1	1:1.86
Non-FUND members					
Canada					
1978	31.1	1.8	32.9		
1979	30.8	0.7	31.5		
1980	28.0	1.1	29.1	24.0	
1981	25.7	1.1	26.8	24.0[a]	

[1]Source: Organization for Economic Cooperation and Development, International Energy Agency, Energy Statistics.
[2]Source: FUND.
[a]Estimate.

Exhibit V-32

SUMMARY OF MAJOR SMALL TANKER
FLEETS OF FUND MEMBERS

	Gross Tonnage 100-499	500-999	1,000-1,999	2,000-3,999	4,000-5,999	6,000-6,999	7,000-7,999	8,000-8,999	10,000-14,999	Total Small Tankers	Gross Tons	Estimated Deadweight	All Tankers	Small Tankers as Percent of All Tankers
Approximate Average DWT	580	1,250	2,500	5,000	8,300	10,700	12,400	14,000	20,600					
Fund Members														
Japan	720	336	97	130	20	5	3	3	6	1,320	1,304,486	2,152,402	1,511	87
Italy	43	44	55	18	7	3	1	3	32	206	684,910	1,130,102	257	80
France	8	1	9	9	1	1	-	-	5	34	11,790	187,754	99	34
United Kingdom	68	55	43	11	1	1	5	1	44	229	787,729	1,299,753	400	57
Spain	6	3	9	6	6	9	5	4	4	52	258,982	427,320	108	48
Germany	32	15	20	-	2	1	-	-	-	70	66,730	110,102	101	69
Sweden	25	12	16	8	6	-	2	-	-	69	109,382	180,480	85	81
Finland	3	2	1	3	1	-	1	-	10	21	141,797	233,965	39	54
Denmark	13	3	6	5	-	-	-	-	-	27	61,287	101,124	66	41
Norway	22	3	7	-	8	-	-	-	9	49	168,205	277,538	165	30
Liberia	5	3	1	1	-	6	1	9	47	73	709,427	1,170,554	708	10
Algeria	-	4	6	-	-	-	-	-	-	10	12,590	20,774	21	48
Kuwait	3	1	-	1	-	-	1	-	2	8	33,950	56,018	23	34
Netherlands	7	21	12	2	-	-	-	2	6	50	132,740	219,021	78	64
Non-FUND Member														
United States	9	16	21	6	5	-	-	1	37	95	687,196	925,420	337	28
Total Above	964	519	303	200	57	26	19	23	202	2,313	5,273,201	8,492,327	3,998	58%
World	1.460	942	599	558	153	52	76	77	479	4,396	12,171,803	20,083,475	6,986	63%
Percent of World	66%	55%	51%	36%	37%	50%	25%	30%	42%	53%	43%	42%	57%	

Note: (1) Deadweight estimated using factor of 1.65 DWT per gross ton.
(2) Ships of less than 2,000 metric tons deadweight are not covered udner CLC convention.

Source: Lloyds Register of Shipping Statistical Tables, 1981.

Exhibit V-33

SUMMARY OF SELECTED FUND-MEMBER COUNTRIES
WITH SMALL-TANKER FLEETS

1981

Country	Number of Tankers	Total Gross Tons	Average Gross Tons
Hong Kong	24	185,909	7,746
Bahamas	4	21,244	5,311
Indonesia	114	267,070	2,343
Yugoslavia	28	266,753	9,527
Ghana	-	-	-
Syria	-	-	-
Papua New Guinea	4	1,577	394
Iceland	3	1,537	512
Monaco	2	16,137	8,069
Maldives	2	1,244	622
Tuvalu	-	-	5,252
Canada	54	283,608	24,577
World Average			

Source: TBS analysis of Lloyds Register Statistics.

Exhibit V-34

SUMMARY OF FUND CONTRIBUTING OIL
WITH AND WITHOUT U.S. PARTICIPATION

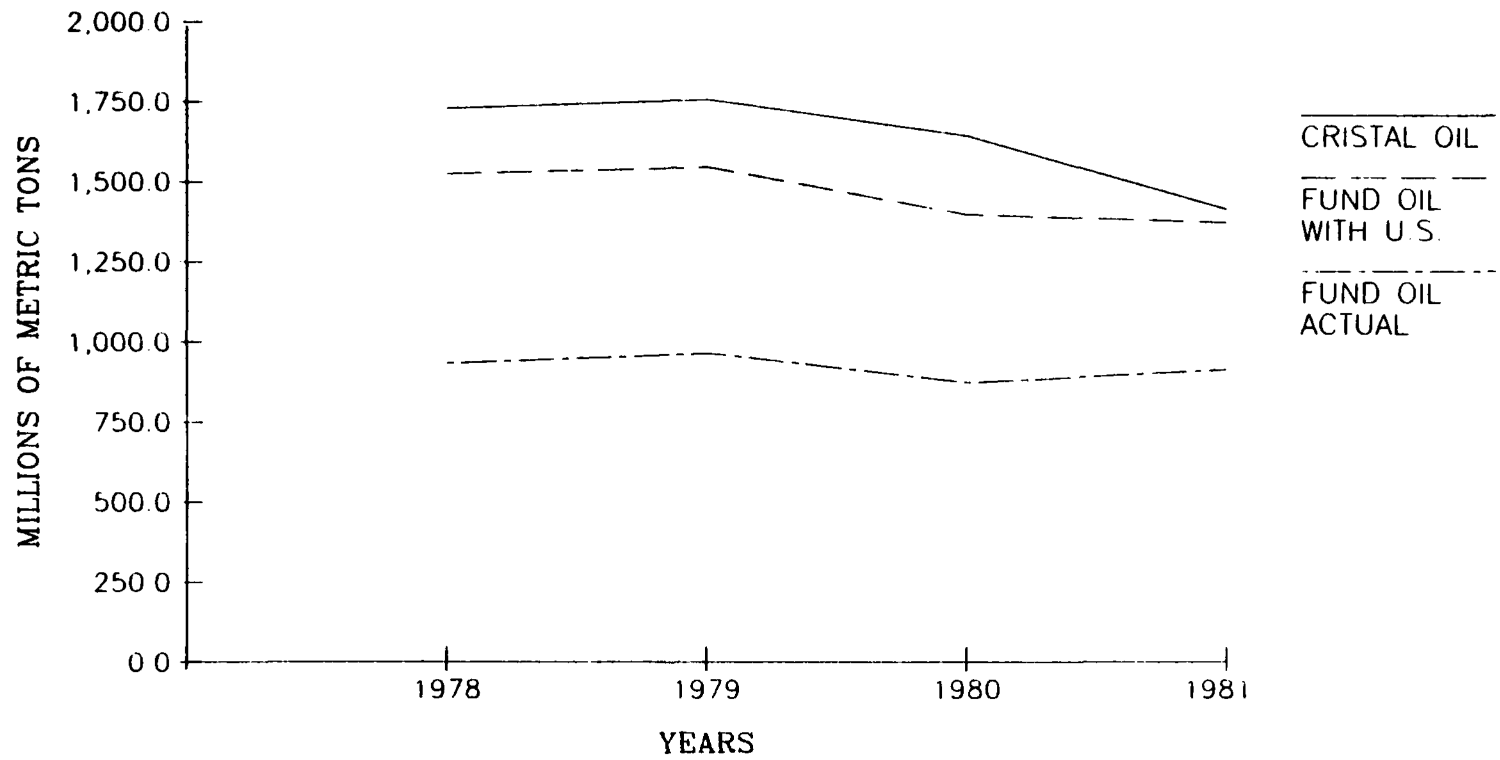
(millions of metric tons)

	1978	1979	1980	1981
Fund Actual	933.8	965.2	872.8	915.2
U.S. Estimated	569.5	564.2	509.5	443.6
Total with U.S.	1,502.3	1,529.4	1,382.3	1,358.8
Japan	349.9	362.8	326.0	286.0
U.S. Share				
With Japan	37.9%	36.9%	36.9%	32.6%
Without Japan	49.4%	48.4%	48.2%	41.3%
Japan Share				
Without United States	37.5%	37.6%	37.4%	31.3%
With United States	23.3%	23.7%	23.6%	21.0%
Number of Contributing Countries without United States	17	17	19	21

EXHIBIT V-35

COMPARISON OF CRISTAL ASSESSMENT CALL OIL AND FUND CONTRIBUTING OIL WITH AND WITHOUT U.S

1978-1981



SOURCE: EXHIBIT V-36

Exhibit V-36a

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1970

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	93.6	40.8	6.1	1.2	7.0	
Coastwise	61.9	56.3	28.8	2.5	3.0	
Lakewise	-	1.3	0.7	0.3	-	
Internal	52.6	44.0	21.9	3.1	1.9	
Intraterritory	-	1.4	0.6	-	-	
Subtotal	208.1	143.8	58.1	7.1	11.9	
Less						
Panama Transshipping Mississippi, Gulf Intracoastal, and Columbia/Snake	32.6	7.2	7.0	3.2	1.6	
Net Seagoing	175.5	136.9	59.5	5.2	3.4	380.5
Net Contributing	175.5	136.9	1.2[1]	-	-	313.6 million short tons
Total						280.0 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

[1]Assumes No. 4 distillate transported by sea is 2 percent of total distillate traffic.

Exhibit V-36b

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1971

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	116.5	80.5	5.8	-	-	
Coastwise	57.0	29.9	43.6	3.2	3.2	
Lakewise	-	1.4	2.4	0.3	-	
Internal	55.8	32.1	18.4	4.5	1.8	
Intraterritory	-	1.0	0.1	-	0.1	
Subtotal	229.3	144.9	70.3	8.0	5.1	
Less						
Panama Transshipping						
Mississippi, Gulf Intracoastal, and Columbia/Snake	32.6	9.3	8.2	3.3	1.6	
Net Seagoing	196.7	135.6	62.1	4.7	3.5	402.6
Net Contributing	196.7	135.6	1.2	-	-	333.5 million short tons
Total						297.8 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36c

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1972

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	143.5	76.8	17.6	-	-	
Coastwise	39.7	37.5	47.1	4.0	3.8	
Lakewise	-	1.5	2.4	0.2	-	
Internal	60.4	35.1	20.9	4.2	1.9	
Intraterritory	-	-	0.1	-	0.1	
Subtotal	247.2	150.9	88.1	8.4	5.8	
Less						
Panama Transshipping Mississippi, Gulf Intracoastal, and Columbia/Snake	34.8	10.9	10.0	3.2	1.5	
Net Seagoing	212.4	140.0	78.1	5.2	4.3	440.0
Net Contributing	212.4	140.0	1.6	-	-	354.0 million short tons
Total						316.1 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36d

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1973

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	197.0	87.9	30.4	-	-	
Coastwise	34.9	36.0	44.1	4.3	4.0	
Lakewise	-	1.4	2.0	0.2	-	
Internal	52.5	40.7	23.4	4.3	2.0	
Intraterritory	3.1	0.5	0.3	-	0.9	
Subtotal	287.5	166.5	100.2	8.8	6.9	
Less						
Panama Transshipping	-					
Mississippi, Gulf Intracoastal, and Columbia/Snake	29.4	12.6	11.1	3.0	1.7	
Net Seagoing	258.1	153.9	89.1	5.8	5.2	512.1
Net Contributing	258.1	153.9	1.8	-	-	413.8 million short tons
Total						369.5 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36e

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1974

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	216.0	81.3	12.1	-	0.1	
Coastwise	33.1	42.5	40.8	3.8	3.9	
Lakewise	-	1.5	1.7	0.2	-	
Internal	46.8	39.0	25.0	4.7	2.3	
Intraterritory	0.2	1.0	0.2	-	0.2	
Subtotal	296.1	165.3	79.8	8.7	6.5	
Less						
Panama Transshipping Mississippi, Gulf Intracoastal, and Columbia/Snake	22.7	16.1	11.9	3.4	1.8	
Net Seagoing	273.4	149.2	67.9	5.3	4.7	500.5
Net Contributing	273.4	149.2	1.4	-	-	424.0 million short tons
Total						378.6 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36f

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1975

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	255.9	59.2	6.3	-	-	
Coastwise	26.0	46.7	46.2	3.2	3.1	
Lakewise	-	1.4	1.5	0.2	-	
Internal	47.6	36.9	24.7	4.3	1.8	
Intraterritory	-	1.2	0.3	-	-	
Subtotal	329.5	145.4	79.0	7.7	4.9	
Less						
Panama Transshipping Mississippi, Gulf Intracoastal, and Columbia/Snake	24.9	15.2	12.7	3.3	1.6	
Net Seagoing	304.6	130.2	66.3	4.4	3.3	508.8
Net Contributing	304.6	130.2	1.3	-	-	436.1 million short tons
Total						389.4 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36g

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1976

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	337.4	66.8	3.8	-	-	
Coastwise	22.4	50.3	45.5	3.7	3.0	
Lakewise	-	1.6	1.7	0.3	-	
Internal	47.5	45.7	26.2	4.0	2.3	
Intraterritory	0.1	1.1	0.5	-	-	
Subtotal	407.4	165.5	77.7	8.0	5.3	
Less						
Panama Transshipping Mississippi, Gulf Intracoastal, and Columbia/Snake	24.2	19.2	14.0	2.7	1.7	
Net Seagoing	383.2	146.3	63.7	5.3	3.6	602.1
Net Contributing	383.2	146.3	1.3	-	-	530.8 million short tons
Total						473.9 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36h

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1977

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	403.6	68.2	7.9	-	0.2	
Coastwise	30.7	51.7	45.5	4.3	3.0	
Lakewise	-	1.8	1.6	0.2	-	
Internal	48.6	49.7	26.9	4.4	2.5	
Intraterritory	-	1.9	0.5	-	-	
Subtotal	482.9	173.3	82.4	8.9	5.7	
Less						
Panama Transshipping	0.7					
Mississippi, Gulf Intracoastal, and Columbia/Snake	22.4	25.0	14.5	2.9	2.1	
Net Seagoing	459.8	148.3	67.9	6.0	3.6	602.1
Net Contributing	459.8	148.3	1.4	-	-	609.5 million short tons
Total						544.2 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36i

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1978

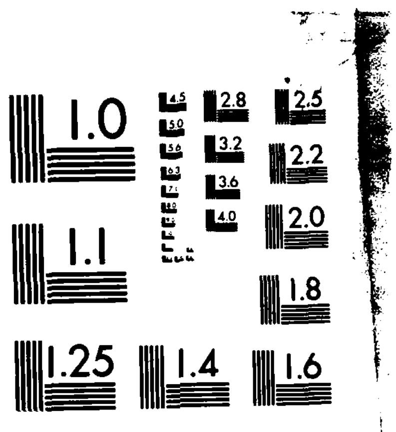
(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	387.2	64.5	3.8	0.9	6.7	
Coastwise	89.4	49.1	42.4	4.5	3.1	
Lakewise	-	1.6	1.4	0.4	-	
Internal	50.5	51.2	24.4	4.6	2.4	
Intraterritory	-	1.5	0.5	-	-	
Subtotal	527.1	167.9	72.5	10.4	12.2	
Less						
Panama Transshipping	18.9					
Mississippi, Gulf Intracoastal, and Columbia/Snake	23.5	26.2	12.6	3.1	2.1	
Subtotal	42.4	26.2	12.6	3.1	2.1	
Net Seagoing	484.7	141.7	59.9	7.3	14.3	707.9
Net Contributing	484.7	141.7	1.2	-	-	627.6 million short tons
Total						569.5 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

AD-A133 111 COST-BENEFIT ANALYSIS OF POSSIBLE US ADHERENCE TO TWO INTERNATIONAL CONVE..(U) TEMPLE BARKER AND SLOANE INC LEXINGTON MA 30 JUN 83 USCG-WER-83-1 DTCG23-82-C-5984 3/4

UNCLASSIFIED F/G 6/6 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Exhibit V-36j

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1979

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	379.2	55.0	4.6	1.5	8.4	
Coastwise	96.1	54.9	41.4	3.7	3.1	
Lakewise	-	1.4	1.3	0.4	-	
Internal	47.2	47.6	22.8	3.7	2.4	
Intraterritory	-	1.7	0.5	-	-	
Subtotal	522.5	160.6	70.6	9.3	13.9	
Less						
Panama Transshipping	17.6					
Mississippi, Gulf Intracoastal, and Columbia/Snake	20.3	24.5	12.6	2.9	2.1	
Subtotal	37.9	24.5	12.6	2.9	2.1	
Net Seagoing	484.6	136.1	55.0	6.4	11.8	693.9
Net Contributing	484.6	136.1	1.1	-	-	621.8 million short tons
Total						564.2 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-36k

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1980

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	306.0	45.6	2.3	1.3	7.6	
Coastwise	126.6	57.5	34.3	2.7	3.0	
Lakewise	--	1.6	0.9	0.3	-	
Internal	41.6	46.1	22.5	3.0	2.2	
Intraterritory	--	1.2	0.6	-	-	
	474.2	152.0	60.6	7.3	12.8	
Less						
Panama Transshipping	25.0					
Mississippi, Gulf Intracoastal, and Columbia/Snake	17.3	23.4	12.4	2.2	2.0	
Subtotal	42.3	23.4	12.4	2.2	2.0	
Net Seagoing	431.9	128.6	48.2	5.1	10.8	624.6
Net Contributing	431.9	128.6	1.0	-	-	561.5 million short tons
Total						509.5 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-361

SUMMARY OF U.S. FUND CONTRIBUTING OIL

1981

(millions of short tons unless noted)

	Crude	Residual	All Distillates	Asphalt, Tar	Lube Oil, Grease	Total
Total						
Imports	261.2	40.8	6.1	1.2	7.0	
Coastwise	131.6	56.3	28.8	2.5	3.0	
Lakewise	-	1.3	0.7	0.3	-	
Internal	35.3	44.0	21.9	3.1	1.9	
Intraterritory	-	1.4	0.6	-	-	
Subtotal	428.1	143.8	58.1	7.1	11.9	
Less						
Panama Transshipping	30.7					
Mississippi, Gulf Intracoastal, and Columbia/Snake	16.1	37.2	11.6	2.3	1.8	
Subtotal	46.8	37.2	11.6	2.3	1.8	
Net Seagoing	381.3	106.6	46.5	4.8	10.1	549.3
Net Contributing	381.3	106.6	0.9	-	-	488.8 million short tons
Total						443.6 million metric tons

Source: TBS analysis of U.S. Army Corps of Engineers Data.

Exhibit V-37

CALCULATION OF ESTIMATED 1970 TO 1980
U.S. SHARE OF FUND MEMBER IN 1983 PLUS
U.S. CONTRIBUTING PERSISTENT OIL

1981

$$\frac{\text{U.S.}}{\text{U.S.} + \text{1983 FUND Members}} = \frac{444}{444 + 915} = \frac{444}{1{,}359} = 32.7\%$$

$$\frac{\text{U.S.}}{\text{CRISTAL}} = \frac{444}{1{,}414} = 31.4\%$$

$$\text{Ratio of } \frac{\text{U.S.}}{\text{CRISTAL}} \text{ to } \frac{\text{U.S.}}{\text{U.S.} + \text{FUND}} = 32.7\% \text{ to } 31.4\% = 1.04$$

The 1970 to 1980 share of U.S. to CRISTAL was 28.4%.

Therefore the 1970 to 1980 share of U.S. to U.S. + FUND is 28.4 x 1.04 = 29.5%.

VI. SEABORNE PERSISTENT OIL TRANSPORT AND TERMINAL ECONOMICS

This chapter examines the relationship between tanker and terminal costs and the current and potential costs incurred by their owners and operators and the oil cargo owners. This chapter places these parties' oil pollution liabilities costs in context of other operating and fixed costs. It examines the potential for cost-pass through to customers and ultimate consumers. The conclusions of this chapter are that pollution liability costs represent very small components of tanker, terminal, and cargo costs and that these costs are and will continue to be passed through to consumers. These costs are so small that they are unlikely to cause any changes in consumer demand and are much smaller than other fluctuations that occur in the marketplace.

A. OIL POLLUTION LIABILITY COST RELATIONSHIPS

1. The Regimes and Primary Liability

The cost of cleaning up oil spills and the third-party claims for damages related to oil pollution are paid for by the four major regimes and their constituents. For incidents that occur under the TOVALOP/CRISTAL regime, compensation is as follows:

- Basic Liability. Payment by the P&I Clubs up to the TOVALOP limits of $160 per convention ton or the $16.8 million maximum ($120 per ton or $10 million maximum with CRISTAL rollback.)

- Top-Off Liability. Claims beyond the TOVALOP liability limit are paid by CRISTAL, up to its limits. CRISTAL payments are made on a specific call basis by the cargo owners enrolled in CRISTAL.

The CLC/FUND regime compensation is as follows:

- Basic Liability. In nations that have ratified the CLC Convention, the liability of shipowners is defined by the CLC limits. The basic cost of this coverage is paid by the P&I Clubs up to the $147 per convention ton limit or the 15.4 maximum (at

end-1982 exchange rates). With FUND rollback, the owner's P&I Club is relieved of costs above about $110 per convention ton or $9.2 million maximum. Payment and liability is similar to that under TOVALOP.

- Top-Off Liability:

  --For countries that have ratified FUND, payments in excess of the CLC maximum liability are paid by FUND, which is funded by calls on FUND-member nations.

  --For nations that have ratified CLC but have not ratified FUND, payments are made by CRISTAL, as described previously.

2. The Cost Pass-Through Relationship

The claimants of oil spill incidents include persons engaged in cleanup and persons who were damaged by the incident. Cleanup expenses are incurred by the discharger or government agencies.

Exhibit VI-1 summarizes the framework for pollution compensation. Claimants are the same under all four regimes with the exception that the cargo-owner regimes--CRISTAL and FUND--occasionally indemnify a portion of the shipowner's liability under TOVALOP and CRISTAL. Ultimately, petroleum consumers pay for the pollution compensation, because these costs are passed through to them.

Shipowner premium payments to the P&I Clubs, which permit the P&I's to provide retained (club-specific liability), pooled (multi-club mutual liability), and reinsured (underwritten liability) compensation are the only source of funds to cover the TOVALOP and CLC obligations. These premium costs are a component of a tanker's operational costs. Over the long run (month-to-month or year-to-year) they will be imbedded in the cost structure and passed on to the cargo owner as part of the freight rate. The tanker's customer is a cargo owner. The cargo owners are most frequently oil companies who will pass this cost on as part of the wholesale price and it will in turn be passed on to the final consumer.

Cargo owner liabilities are funded on an assessment call basis from cargo owners that are members of CRISTAL or from terminal contribution under FUND. In either case, these costs are part of an oil company's or terminal operator's cost of doing business, are included in the annual budget process, and are

incorporated in the wholesale-distribution retail-distribution cost base.

The impact of the costs of oil pollution compensation is ultimately borne by petroleum consumers. The increase in cost of petroleum products due to oil pollution liability compensation, in theory, results in some reduction in the demand for petroleum products, and if the additional cost is not passed on to the ultimate customers of the petroleum products' consumers, it can reduce the profitability and viability of these enterprises.

This theoretical set of relationships and problems must be evaluated. These problems can be largely explained by evaluating the pollution liability costs in relationship to the overall cost of the petroleum consumed and the volatility of the costs of petroleum, its transportation, and taxation. If the absolute level of these costs are relatively insignificant in the environment in which they occur, then their impact can be practically assumed to be insignificant to the producers and consumers involved. If compensating cost trends can and do occur, such as declines in crude oil prices, and freight rates, then relatively small increases in cost will have an insignificant impact on the economy. If the producers and consumers face a variable marketplace because of political and economic factors, then the impact of a small increase in cost will have limited practical impact.

The remaining segments of this chapter explore the impact of pollution liability compensation in the context of the petroleum industry and the producers, transporters, terminal operators, and consumers of petroleum products.

B. OVERVIEW OF THE OIL TANKER INDUSTRY

1. Ownership

The world's oil tanker fleet is owned by government agencies and national oil companies, major and minor oil companies, and independent operators. The long-term trend has been a decreasing share of oil-company-owned tonnage, but in the last decade, oil company ownership increased to 39 percent of tanker deadweight in October 1982, up from 35 percent ownership in January 1974, during the OPEC embargo. Exhibit VI-2 summarizes the composition of world tanker fleet ownership. The 39 percent oil company ownership is consistent with longstanding practices.

Oil company ownership reflects the need for companies to participate in transportation as a means to ensure that service

and cost requirements are adequately served and to provide some dampening of potential fluctuations in marketplace. Oil company participation in tanker operations is also a form of value addition, which in good times provides another form of return of assets and operations. Oil company fleets provide a basic share of capacity on critical or major crude oil, general products, and specialty products trade routes. In periods of rising or high freight rates, when revenues may exceed fully allocated fleet costs, the oil company fleets serve as a source of stable cost-based capacity. In periods of falling or depressed freight rates, when revenues fall below full cost levels and may be only a portion of variable costs, the oil company's fleets serve as a source of higher cost, but dependable and available transportation capacity. Most oil companies internally price their tanker services at or close to prevailing market rates, which are determined by a mixture of long-term and short-term contracts. If oil company transportation costs are significantly higher then market rates, analysis of cost-reduction opportunities and service levels may indicate that the lay-up, scrapping, or sale of owned tonnage is appropriate.

Exhibit VI-3 graphically compares the ownership of the world's oil tanker fleet in total and by size. It is evident that some size categories of tankers (less than 70,000 deadweight-tons and the 175,000-225,000 deadweight-ton range) have declined in total because of capacity scrapping in response to changes in trading patterns, port capacities, and economics. Oil company participation in the smaller tanker sizes declined slightly in absolute terms and increased as a percent of the small tanker fleet. In other tanker sizes, notably the 125-175,000 deadweight-ton range, the VLCC range 225 t 300,000 deadweight-tons and ULCC range (over 30,000 dwt) total ɪleet size increased rapidly and oil company participation was strong.

The independent tanker fleets are operated on spot (single voyage) short-term (up to one year) and long-term (more than one year) charters to oil companies, governments, utilities, traders, and certain industries. Oil company tankers are deployed in private service or can be chartered out to other oil companies, depending on market and operating conditions. In general, the prevalence of period charters tends to increase when the market in expected to yield higher rates. When market rates are expected to decline, the charter periods will tend to decline in number and duration. Charterers and shipowners will always have opposite interests in the marketplace. At any given time one or the other will seek to lock-in a portion of their tanker capacity at prevailing rates, while the other will want to remain in the spot market pending an improvement in conditions.

2. Independent Tanker Owners' Relations with Oil Companies

Independent and oil company tanker fleets utilize virtually identical ships, technologies, and personnel, and their cost levels and structures are similar. Differences between oil company and independent fleets, in terms of standards of service, cost efficiency, and safety, reflect the resources, objectives, personalities, and responsibilities of their managers as well as other specific conditions. The range of safety, service, and efficiency is broad for both oil company and independent fleets. The most competent, highest quality, and most cost-effective fleets in the world would include both independent and oil company fleets. Likewise the least competent, least service-oriented, least cost-effective fleets also include independent and oil company fleets. Few stereotypes and generalities can be made about the conditions and standards of the world's independent and oil company fleets.

During the late 1960s and first half of the 1970s, the average size of ships under construction increased dramatically, as oil companies sought to reduce freight rates through the economies of larger tankers. In the environment of increasing transportation demand and larger and larger tankers, oil companies sometimes chartered independent tonnage even before construction began. Both oil companies and independents emphasized quality construction and operations, and coordination in design frequently occurred. Relations between tanker owners and oil companies were relatively close and cooperative. The tanker fleet enjoyed full employment and rates were improving.

After the effects of the OPEC oil embargo and price shock and the recession of 1974/1975, the oil companies sought to reduce the size of their owned and chartered fleets and to reduce the costs of transportation. The cost reductions required that high-cost capacity be sold, chartered out, or dropped upon expiration of charters. This strategy permitted oil companies to utilize an increased portion of tanker capacity available on the depressed, low-cost spot market. As Exhibit VI-4 shows, the proportion of the world's independent fleet on long-term charter has declined since 1973 from 80 percent of the fleet to 25 percent in 1982.

The result of this shift in the relationship between oil companies and independent operators from a predominantly stable, ongoing set of time-charter relationships to the predominantly voyage-to-voyage spotcharter relationships of late 1982 has been an increasing divergence of interest between the independents and the oil companies. This divergence specifically relates to the

allocation of oil pollution liability between shipowners and cargo owners. Independent shipowners feel that they are operating in a highly cost competitive and depressed rate environment with no prospect for rate improvements for years because of the oversupply of tankers and declining transportation demand. In this environment, they argue that the oil companies control the marketplace and put enormous pressure on the independents to operate at the lowest possible cost. An increase in shipowner liabilities will increase shipowner's pollution liability premium expenses. Shipowners are concerned that oil companies will be able to resist payment of this additional cost, forcing independents to absorb some portion of the increase. This would aggravate the shipowners' tenuous financial positions.

The oil companies contend that this cost can be passed through to them in the way that all tanker costs are. The oil companies do not feel that they will or should guarantee that all of this cost will be passed through because in periods when freight rates were very high, the independents did not resist the temptation to charge what the market would bear. The oil companies contend that they are committed to chartering high-quality, competent, and safe tonnage, which should have average or better pollution liability insurance premiums. Tankers that have this quality will be competitive and chartered, they argue. Tankers that are substandard will likely have higher than average premium costs and will not be competitive. There will be little incentive for oil companies to charter these tankers and, they argue, not chartering these will lead to their lay-up or scrapping, reducing tanker capacity and improving market conditions and freight rates for the surviving tankers.

This divergence of opinion requires that the cost of the pollution liability premium be put into context.

C. INTERNATIONAL OIL TANKER FREIGHT RATE LEVELS

Overview

The financial condition of the oil tanker industry is driven by economic forces related to the tanker capacity supply and the demand for it. Few industries experience the volatility of prices and revenues of the tanker industry. The relationship between revenues and total costs reflects that the tanker operators and their bankers prefer to generate revenues and some contribution to fixed cost, rather than to lay-up or scrap ships.

Historically, the industry has been characterized by long periods of depressed rates punctuated by sharp upward spikes in rates that are caused by discrete increases in petroleum transportation requirements. The Suez crisis and canal closure of 1956, the Six Day War-Suez Canal closure of 1967, and the post-October 1973 War embargo period of 1973 and 1974 were major causes for rapid upward and downward movements in rates in the last 25 years. The reopening of the Suez Canal in 1975 and the completion of various pipelines, the development of Mexican, Southeast Asian, and Alaskan crude oils, and several recessions have had depressing effects on tanker rates in the past decade.

The critical supply and demand balance is subject to daily changes in the demand side due to economical and political conditions. Tankers can be ordered and delivered in one to three years, depending on shipyard backlogs, and have potential useful lives of 20-45 years. Exhibit VI-5 shows that, since 1973, supply has exceeded demand by a significant margin. Demand ended a rapid rise in 1973 and has stumbled and declined since then. Tank vessel capacity continued to increase rapidly between 1973 and 1977, even as demand fluctuated at much lower levels of growth. Since 1977, tanker capacity has declined, but not sufficiently to bring supply and demend into alignment to achieve as improvement in rate levels.

Oil tanker economics are primarly driven by the cost of incremental capacity to transport cargo. Tanker services are purchased at rates that approximate the cost of the most efficient tanker available that is suitable to provide the transportation. Since 1973, rates have been stable or declined to very low levels due to surpluses of capacity. This reflects the availability of tanker capacity to serve the market. In periods of overcapacity, larger tankers accept smaller cargoes, using their economies of scale to compete against smaller tankers that, in better rate environments, would have carried the cargo at higher rates. Older, less efficient tankers with low capital costs compete against newer, more efficient tankers with higher capital costs. Rate levels can sink to points just above the conditions that would cause operators to lay-up or scrap their ships.

The freight rates paid for tanker services are summarized graphically in Exhibit VI-6 for tankers of various sizes. These freight rates are expressed in terms of Worldscale points, which indexes baseline revenue per ton rates for a hypothetical tanker on many trade routes. The rates offered to a tanker owner or a cargo owner can be readily compared by the use of Worldscale indices. The base Worldscale rates are adjusted every six months for changes in tanker operating costs including crew, port expenses, canal tolls, fuel, suppliers, maintenance and repairs,

and insurance. As costs change, the basis for market rates also changes, and in the recognition of cost changes becomes embedded in rate quotations. The variability of fuel prices on a week to week basis is far more significant than any change in insurance costs, and the market has recognized their impact. The exhibit shows that rates peaked in the third quarter of 1973 and have fallen from those levels. The Average Freight Rate Assessments (AFRA) tracked in the exhibit trace the average, spot and period time charters for the period in Worldscale points. It can be seen that with the exception of the general-purpose-size tankers, revenues to shipowners declined by approximately half in real terms between the 1972 peak and 1982. Exhibit VI-7 presents the AFRA rates and the cost escalation increases that were built into the flat (Worldscale 100) rates to compensate for cost increases, including insurance.

Exhibit VI-8 traces the size of average persistent oil tanker cargo lot sizes by major trade route for the 1973-1982 period. The largest cargo sizes are fixed for loading in the Persian Gulf. Average cargo sizes in excess of 150,000 tons are fixed from the Persian Gulf to Europe. Cargoes loaded at terminals outside the Persian Gulf are generally fixed in cargo sizes of less than 100,000 tons. U.S. cargoes generally arrive in cargo sizes of between 50,000 and 100,000 deadweight-tons. Cargoes delivered to Caribbean terminals for transsloading to the United States arrive in the Caribbean in lots in excess of 100,000 tons and are delivered to the U.S. in 50,000- to 100,000-ton sizes.

The charter data indicate that the size of cargoes generally declined with a few exceptions. This trend was caused by weak demand for crude oil and falling oil prices which caused refineries to minimize inventories.

D. SHIPOWNERS LIABILITY INSURANCE AND SPECIFICALLY POLLUTION INSURANCE COSTS

1. Premium Basis

Independent and oil company tanker owners purchase oil pollution protection and insurance from the P&I Clubs as summarized in Chapter III. P&I Clubs provide shipowners with a wide range of protection and indemnity, covering events and expenses including crew injury, sickness and death, damage to structures, wreck removal, cargo loss, oil pollution, stevedore injury and death,

etc. Oil pollution indemnity is but one part of the the P&I package purchased from the P&I Clubs.

Tanker owners pay P&I Clubs advance and supplemental premiums to cover the expected cost of coverage for the current year and to cover liabilities incurred in prior years. As a rule, the P&I Clubs attempt to minimize the supplemental calls by accurately estimating tanker owners' liabilities at the outset of the period. Although average P&I premiums would differ very little between the clubs for a specific owner, the P&I premium costs do vary between owners. This is because the P&I clubs consider several factors when they establish an owner's P&I premium expense. These include the following:

- Age and condition of the tankers
- Cargoes carried dirty (persistent) or clean (non-persistent)
- Typical trade routes and patterns
- Competence and composition of officers and crew (nationality, age, training, experience)
- Prior claims experience in all P&I categories (new claims, cargo loss, wreck removal, oil pollution, etc.)
- Overall club experience

Because pollution is but one component of the P&I Club's coverage, it is difficult for clubs to break out pollution compensation costs by tanker owner, tanker size, or type of owner. However, tanker P&I premiums and P&I Club outlays are not necessarily higher than those for other ship types of similar size. For example, containerships can incur claims from stevedores, while tankers rarely require the services of stevedores. In addition, cargo damage is less common in the tanker trades than it is in a general cargo operations. Shipowners with crews that are likely to sue for injury or death will likely pay a higher premium than they might otherwise. Similarly, a tanker owner with an excellent record of safe operation but also with a reputation for insisting that pollution cleanup and compensation be performed to a high standard may find that his premiums are higher than average.

In many cases P&I insurance is purchased from two sources: the P&I Clubs can provide general and pollution coverage, or a shipowner may purchase general coverage from a P&I Club and pollution compensation coverage from ITIA (the International Tanker Indemnity Association), which is an oil-industry-sponsored mutual

association dedicated to providing tanker pollution liability coverage to tanker owners and bareboat charterers.

2. Premium Levels

Protection and indemnity tanker premiums increase in annual cost with ship size, but decline in cost per ton. This reflects the gradual increase in crew and damage-related liabilities with ship size. Exhibit VI-9 compares P&I premium estimates for ships between 7,500 and 265,000 deadweight-tons. TBS estimates for average ships are close to estimates developed by others for British-flag and typical ships, but the variability of premiums based on differences in tanker characteristics is evident.

Exhibit VI-10 presents an analysis of the composition and timing of ship P&I premiums. Supplemental calls, also called back calls, are assumed to be equal to about 25 percent of the advance call for the current year. These costs were developed for a British-flag tanker that operates at a relatively high safety standard. Its P&I costs are therefore lower than the world fleet average.

Exhibit VI-11 summarizes the shipowners liability for oil pollution incidents for the 1970-1980 period. Total costs were $347 million ($1982) which is equivalent to $4,556 per tanker per year or about $0.21 per gross ton per year. Sixty percent of these liabilties were for incident with total incident costs in excess of $250,000. These incidents are the subject of intensive analysis in Chapter VII. Exhibit VI-12 summarizes the costs of oil pollution liabilities entered in the Internation Group of P&I Clubs and ITIA and adjusts these costs to a consistent 1982 basis.

3. Protection and Indemnity Costs in Relation to International Tanker Costs

The P&I premium costs incurred under the current TOVALOP and CLC provisions and under any revised provisions must be evaluated in the context of tanker costs and revenues. Tanker costs comprise several components:

- Voyage expenses related to specific voyages. These include brokers fees, agents fees, port, pilot, and canal dues and taxes, and fuel oil.

- Operating expenses related to the operating of the tanker. These include crew compensation, subsistence (food), ships stores, maintenance and repair, insurance on the hull, and P&I insurance.

- Fixed expenses including management expenses (overhead), as well as some return on capital or assets employed. These expenses vary widely between book and cash expenses due to the age and book and market value of the ship as well as the debt levels and structure of the owner and the specific ship.

In the spot and short-term charter markets of recent years, some tankers have been frequently operated at revenue levels below their operating costs. Revenues have been insufficient to cover voyage and operating expenses and owners have incurred out-of-pocket expenses to cover the costs incurred. In this environment, no funds were generated from tanker operations to contribute to fixed costs. In some cases, interest and/or principal payments have been unpaid or have been covered by other vessels that have gererated some contribution to fixed costs. Many tankers have been scrapped and others have been laid up to await improvements in rates.

Exhibit VI-13 summarizes the results of an analysis of costs, revenues and P&I premiums for tankers between 7,500 and 265,000 deadweight-ton. The P&I premium amounted to between 1.8 percent and 0.9 percent of the tankers' voyage and operating expenses. Exhibit IV-14 presents the characteristics of international oil tankers and Exhibit VI-15 summarizes the annual costs of those tankers including the P&I premium components. Exhibit VI-16 shows that current world spot and tanker time-charter rates yield significant losses for all but the smallest tankers.

5. Protection and Indemnity Costs In Relation to Domestic Tanker Costs

The U.S.-flag tank vessel fleet is engaged in a variety of trades, including domestic coastwise, local, and foreign trade. U.S.-flag tankers operate within the coastwise trades (restricted to unsubsidized U.S.-flag tankers under the Jones Act) without construction or operating subsidies, on charter to the military without subsidies, and in some segments of the foreign trades. With few exceptions, U.S.-flag tankers are operated as either Jones Act or subsidized tankers. U.S.-flag tank barges are

almost exclusively built and operated in the Jones Act coastwise trade.

In general, U.S.-flag shipowner costs are higher than foreign-flag costs. This is because of the higher wages paid to U.S. crew members, shipyard workers, managers, and suppliers, and the requirement that all Jones Act, and until recently all foreign trading, subsidized ships be built in the United States. It is also because of the tendency for U.S. shipyards to bid projects at full cost, which is in contrast to the policies of many nations. In addition, U.S. shipowners finance ships at market rates rather than at subsidized interest rates. U.S.-flag P&I costs are no exception to this U.S./foreign cost differential. The great majority of the U.S.-flag P&I premium differential is related to liabilities other than oil pollution. The primary factor is crew-related liability claims. U.S. crews tend to file claims more frequently and for larger amounts of money than do foreign crews. Accordingly, U.S.-flag operators pay as much as three times more for P&I coverage than the typical foreign-flag operator with a similar ship and crew competence level.

Exhibit VI-17 summarizes the characteristics of a range of typical U.S.-flag persistent oil carrying ships. They range in size and configuration from a 7,500 deadweight-ton tug and barge to a 265,000 deadweight-ton tanker. Exhibit VI-18 presents typical annual operating costs for each. P&I premiums range from 2.7 percent of operating and voyage cost for the 7,500 deadweight-ton tug/barge unit, to 1.2 percent for the 265,000 deadweight-ton tanker. This percentage is higher than that incurred by international tankers. Exhibit V-19 presents an estimate of required rates and returns to recover operation, voyage, and total costs. U.S.-flag rates have been declining since early 1981, and in mid-1982 typical coastal rates were approximately AR 130-AR 160 on the American Rate (AR) scale. It is clear that new U.S.-flag tankers operating in the spot market would have some difficulty generating the AR 150-AR 189 they require.

Exhibit VI-20 presents a comparison of international and U.S. tanker costs and the impact of P&I premiums.

E. TERMINAL OWNERS' LIABILITIES FOR OIL POLLUTION COMPENSATION

1. Overview

U.S. persistent oil terminals are composed of three major types:

- Crude oil tank farms--at least 95 percent of the receiving capacity is located at oil refineries. The remainder is located at terminals that service oil transshipping sites, tanker loading terminals, etc.
- Residual oil terminals--the majority of these terminals are located at refineries, bulk stations engaged in wholesaling or retailing operations, and private terminals.
- Lubricating oil and grease terminals--the majority of these terminals are located at refineries or at terminals for oil and grease processing and sales.

The petroleum terminaling business adds a very small value to the petroleum products handled at the terminals. The costs of terminal services at refineries are included in overall or refinery operations costs, and as a result, no data on the costs of terminaling oil at receiving (pre-processing) or shipping (post-processing) tank farms are available. U.S. Bureau of Census data are available for terminals that are located within refinery areas but operated as a separate business, and for terminals that are located at sites separate from refineries.

2. Characteristics of Oil Terminals

The oil terminal industry is characterized by high labor force productivity, low value-added, small margins of cost and profit, and fixed investments. Persistent oil terminaling is primarily conducted by large businesses. As Exhibit VI-21 shows, 98 percent of petroleum storage capacity is in bulk terminals with more than 50,000 barrels capacity and their operating expenses as a percent of sales were less than 3 percent in 1977. This percentage was lower in 1982 when the price of petroleum outpaced the cost escalation of the terminal operation. For the residual oil terminals, nearly 75 percent of the capacity was at tank farms with capacities in excess of 150,000 barrels.

Exhibit VI-22 shows that the bulk terminals had an average employment of 19 persons, compared to 6 at the smaller bulk stations. Operating budgets at typical petroleum bulk terminals were less than $1 million in 1977 and payroll accounted for roughly 45 percent of operating expenses. In 1977, the average operating expense per barrel handled was $2.69 (6 cents per gallon) for the smaller bulk stations and $.56 per barrel (1.3 cents per gallon) for the bulk terminals. 1982 costs are estimated at about $4.14 and $.86 per barrel, respectively. Due to the 150,000 metric ton per year minimum throughput for FUND contributions, only bulk terminals would be liable for contributions. The average 1982 bulk terminal operating expense of $.86 per barrel represents about 3 percent of the value of a typical barrel of persistent oil ($30.00 per barrel).

3. Analysis of Persistent Oil Terminal Ownership

To identify the potential payers of FUND assessment calls, TBS evaluated persistent oil receivers at various U.S. ports. FUND does not require contributions from nations or companies that receive less than 150,000 metric tons per year. This roughly equates to a minimum level of activity of 1 million barrels per year of residual oil and 1.05 million barrels of crude oil. To operate at 150,000 metric ton minimum, an oil refinery with its own seaside crude oil receiving terminal would have a throughput of only 2,900 barrels per day. Few refineries are this small. Therefore, almost all refiners that receive crude oil from seagoing vessels will be contributors to FUND.

Based on the assumption that industries consume fuel oil inventories approximately once per month, a private fuel oil capacity of 83,000 barrels is a rough limit for FUND contributing liability. This is based in part on 1977, U.S. Bureau of the Census data, which indicated a national average 9.7 barrels fuel oil sales per barrel of capacity. Although various industrial fuel oil receivers were identified, their terminals tended to have fewer than 50,000 barrels of capacity and these companies would not likely be FUND contributors. These included cement companies, prisons, bakeries, metal manufacturers, chemical producers, sugar refineries, ship operators, and others.

Exhibit VI-23 presents the results of a sample analysis of persistent oil terminals at seven U.S. ports. Oil companies account for at least 91 percent of all capacity and utilities account for the remainder. Industry and municipal terminal operators have capacities of 51,000 barrels on average and would be

unlikely to incur FUND liabilities because of their small persistent oil receipts. It is possible that some large corporations would receive more than 150,000 metric tons in aggregate at various facilities, but these situations would be rare.

F. SUMMARY OF ECONOMIC IMPACT OF OIL POLLUTION COMPENSATION COSTS ON OIL PRICES

1. Current Costs

The costs of the pollution liability regimes have been incurred for several decades at various levels. Tanker owners' costs have been incorporated into the market structure. Exhibit VI-24 summarizes estimated current oil pollution P&I premium costs for foreign-flag tankers and U.S.-flag tankers. It can be seen that U.S.-flag seagoing barges incur a relatively high cost--roughly double those of self-propelled tankers. U.S.-flag costs for domestic operations are slightly higher per barrel than international costs per barrel because of higher pollution costs that outweigh the potential economies of shorter trips and more cargoes per year.

2. Possible Costs Due To Shipowner Liability Amendments

As discussed in Chapters IV, V, and VI the IMO is considering revising shipowner liability limits under CLC. These changes will most likely increase shipowner liabilities and reduce the number of incidents that require FUND "top off" compensation. While these changes have not been finalized, TBS developed in Part I of this report five alternative limit of liability levels for evaluation. These same alternatives are evaluated here to quantify the additional costs of liability coverage that shipowners would be liable to pay in the form of additional P&I premium costs.

The TBS analysis evaluates the implications of revised limits on the compensation that would be paid for major incidents with total costs of more than $250,000. In addition, shipowners would have increased costs related to incidents with total costs of less than $250,000.

Exhibit VI-27 shows that the additional cost per gross ton would increase by $0.05 to $0.14 per year under various options. If assessed on a per tanker basis costs could increase by $1,000 to $3,000 per tanker.

Tanker owners would be concerned about how any additional liability costs would be allocated between small and large tankers. Exhibit VI-28 illustrates the problem by comparing the implications of passing through this cost increase on a per gross ton or per tanker basis. Under the most conservative option of a $50 million flat level of minimum and maximum ship owner liability, a 7,500 dwt tanker would face a $626 P&I premium increase if the increase were recovered on a per tanker basis. A 265,000 dwt VLCC would have an $18,418 additional premium cost if the increase were recovered on a gross ton basis, but, like the 7,500 dwt tanker only a $3,044 increase if the increase were recovered on a per tanker basis.

The greatest small shipowner exposure is a 9 percent increase in P&I premium if the increase is recovered on a per tanker basis. The VLCC would have a 15 percent increase in P&I premium cost if the increased shipowner liability were levied on a per gross ton basis. The actual increases would probably reflect a combination of factors. Exhibit VI-29 traces the size of the petroleum tank vessel fleet during the 1970-1980 period. Exhibit VI-30 graphically summarizes the differences between the number and capacity of tankers and shows that while the majority of tankers are small, the majority of tanker capacity is in much larger vessels.

2. <u>FUND Costs to Terminal Operators</u>

Exhibit VI-31 analyzes the total cost and cost per barrel that would be paid by U.S. contributing oil terminal operators at a variety of FUND liability levels reflecting differrent world oil spill experience. Annual FUND liabilities based on 1970-1980 experience are projected to be $6.2 million per year for the U.S. This would correspond to a FUND contribution by oil terminals of two-tenths of a cent per barrel, or about 0.2 percent of terminal operating costs.

G. ECONOMIC IMPACT OF OIL POLLUTION LIABILITY COSTS ON PETROLEUM CONSUMERS

1. Summary

The U.S. economy, petroleum consumers, tanker owners, and the oil companies have operated for more than a decade in an environment with oil pollution liability costs that have increased with inflation and increases in liability. Changes in the mechanisms that deal with the costs are primarily related to proposed amendments in shipowner's liability.

A change of less than one cent per barrel on persistent oils moved to and within the United States will have no measurable impact on the consumption of petroleum products nor on general economic activity in sections critically dependent on oil. The degree that increased liability costs will be passed through to consumers will depend on regional market conditions for various petroleum products and on the market structures that relate oil producers, refiners, transporters, wholesalers, retailers, and consumers. These factors will either magnify or diminish the degree to which the increased oil pollution liabilities related to crude oil and persistent oil products may be passed through to the consumer level. Even if all of the increased liability were to be passed through in the form of higher prices on only a single petroleum product, an examination of market structure and the technical literature on petroleum demand elasticity indicates that the economic impact will be negligible.

This conclusion is based on analysis by TBS that used two approaches: (1) a review of petroleum product mark-up practices and retailing and transportation costs for various major petroleum products was performed; (2) the implications of recent technical studies of the elasticity of demand for various petroleum products were reviewed.

2. Review of Operations and Economics

During the past two years, petroleum product demand has declined in the world's major petroleum markets, the United States and Europe. Refinery margins in both the United States and Europe have at times been negative. Losses of as much as $6.00 per barrel have been incurred by some refinery operations at some times. These losses were caused by low utilization, high fixed costs, and weak prices caused by weak demand and a highly

competitive marketplace. Under certain conditions some U.S. refineries and a few European refineries have been able to produce operating profits of $2.00 to $3.00 per barrel in 1982. These favorable margins were usually produced by a combination of high quality North African crude, which tends to generate higher yields of more valuable light products (such as gasoline) and upgraded refineries with extensive crude oil cracking facilities capable of minimizing the production of low-value, heavy fuel oils.

The tendency of integrated oil companies to continue to operate refineries despite considerable losses incurred on each barrel of crude processed can be explained by two aspects of oil company strategy. Traditionally the marketing departments of integrated companies have tended to regard their market share of petroleum product sales almost as a capital asset. Petroleum suppliers fear that losing market share, even on unprofitable operations, might benefit competitors in the long run. In the desire to maintain market share, some basic elements of profitability on crude costs are often sacrificed.

Second, the refining divisions of oil companies are dedicated to minimizing unit costs by maximizing throughput. This is particularly true for recently constructed sophisticated upgrading facilities. Some cuts in refinery capacity have occurred but these have been predominantly in the United States where the American Petroleum Institute estimates that in 1982 some 2.3 million barrels per day, approximately 13 percent of U.S. refinery capacity, was temporarily or permanently shutdown. The scrapping rate of redundant facilities has tended to be much lower in Europe because of government pressures to keep employment levels up by keeping refineries operating. This in turn increased pressures on European refiners to export products and compete with U.S. refiners on price.

While a single-minded pursuit of divisional goals in the marketing and refining divisions of integrated oil companies tends to impede more rational crude acquisition and operating policies, the internal cost allocation procedure and transfer pricing process of these same companies makes it difficult to derive precise production costs for individual petroleum products. Transfer prices and cost allocations serve three purposes in the area of resource allocation: (1) to assist with capital budget decisions; (2) to allocate taxes; and (3) to optimize corporate activities. Each integrated oil company emphasizes these purposes in different ways at different times and it is therefore impossible to generalize how oil companies will recover the oil pollution liability costs and increases. Some companies

assign all pollution liability costs to refiners as a semi-fixed expenses, others assign residual oil contributions and liabilities to residual oil. Others might charge marketing organizations with the costs of terminal receipts and contribution liabilities.

3. Acquisition Cost Impact

A one cent per barrel increase is an insignificant change in terms of overall crude oil acquisition and refining costs. Official posted prices tend to move in increments of five cents per barrel. Differentials arising from either advantages in market access or quality tend to be measured in a similar fashion. On the spot market, where prices have been more volatile, changes of $1.00 per barrel during a week are not unusual even in the soft demand conditions of 1982. Domestic crude acquisition prices have tended to move in similar size increments and volatility. Differentials paid by refiners for the quality domestic crudes in 1982 have ranged from as little as two cents per barrel for a full degree of quality increment at sometimes, to 1.5 cents per barrel for as little as one-tenth degree of quality adjustment.

Variations in crude oil transportation charges, while constituting a small percentage (generally less than 7 percent) of total refinery acquisition costs for imported crude oils, are also much larger in scale than the proposed one cent per barrel levy. For example, during 1982, per barrel costs for a shipment in a VLCC from the Persian Gulf to the United States were between $1.50 and $2.00 per barrel for oil with an FOB price of about $33.00. Domestically, typical pipeline rates for delivery from a West Texas field to a Gulf Coast refinery are around 50¢ per barrel.

Very little information is publicly available on actual refinery operating costs and the allocation of these costs--crude oil, refinery fixed costs, and refinery operations--between the products produced. The primary variables in refining costs are capital costs, operating rates, energy costs, and taxes. A recent East-West Center Study estimated refinery costs to be the following for three representative (but hypothetical) refineries: $3.83 per barrel for a new Persian Gulf export refinery, $4.40 per barrel for an existing OECD (Organization for Economic Cooperation and Development) refinery, and $5.32 for a new or upgraded OECD refinery.

Thus, costs in the acquisition, transportation, and refinery of crude oil tend to be of such a magnitude that the imposition of a 1¢ per barrel levy would almost certainly have no economic impact on existing practices and procedures.

If one assumes that the refiner chooses not to absorb the cost of shipowner and terminal pollution liability costs but instead passes it through as an ex-refinery price increase on only 20 to 30 percent of the product produced by the refinery; for example, on diesel fuel, or home heating oil (No. 2 oil), and residual oil--the analysis is similar. Although the dollar value added through inventory, transportation, or distribution and sales costs once a barrel of product leaves the refinery is relatively small compared to crude acquisition and refining costs, the per barrel variations in all these charges again dwarf a one cent per barrel passed through increase.

As the market for both gasoline and home heating oil has decreased in size, margins accruing to dealers for sales, overhead, and profit have increased in absolute terms but declined in relative terms. For home heating oil, where reasonably good figures exist, margins have increased from approximately 8 cents per gallon in the pre-1973 period to more than 16 cents per gallon in 1981. These increases have been consistent with increases in costs. In relative terms, however, margins have declined from about 35 percent in the pre-1973 period to approximately 14 percent in 1981, as crude oil prices have increased. The competitive environment resulting from a market that is declining in overall size suggests that, like other tax and crude oil cost increases in the post-1973 period, at least some of the 1¢ per barrel oil pollution liability cost might be absorbed by retailers.

Transportation and storage costs for product wholesalers or major consumers, such as large industrial users and electric utilities are also of sufficient magnitude to make insignificant a one cent per barrel passed through price increase. For example, at the 15 percent interest rates prevailing in recent years, finance carrying charges alone on a stored barrel of residual oil came to about 35 cents per barrel each month.

The magnitude of the various costs involved in crude oil acquisition, transportation, and refining and in product transportation, storage, and sales is such that a levy of one cent per barrel on crude will have no significant impact on current economic behavior. The degree to which the levy will be absorbed either by refiners, wholesalers, or retailers will vary with individual companies and with the competitive climate prevailing in various geographic product markets.

It is possible to hypothesize certain market conditions, most notably rising demand for a particular product, where the entire levy is passed on to the end consumer in the form of an increase on only a single petroleum product. Such an extreme situation is most likely to occur in the case of diesel fuel, less likely in home heating oil and gasoline, and totally unlikely in the case of residual fuel oil. In such an instance, a one cent per barrel levy on crude could produce as much as a 0.3 cent per gallon rise in product prices.

If such an increase did occur in certain product markets it is unlikely to have a measurable impact on consumer behavior. A great deal of theoretical work has been done in the past decade on demand elasticities for various petroleum products. TBS reviewed a significant number of publicly available studies and surveys of this issue in preparing its conclusions for this study.[1]

Elasticity of demand can be briefly defined as the ratio of the percentage change in consumption induced by a percentage change in price. Recent studies have indicated, for example, that the short-run elasticity of gasoline is -0.38 and the long-run elasticity is at least -0.50. For home heating oil, studies have indicated elasticities of -0.76 and -0.64, while for residual oil figures as high as -1.58 have been calculated. The relevance, however, of these studies to a very small rise in product prices is questionable. Most studies of demand elasticity assume at least a 2 percent margin of error, a figure about eight times as large as the maximum product price increase under consideration due to oil pollution liability compensating costs.

---

[1] M. L. Baughman and P. L. Joskow, "Energy Consumption and Fuel Choice by Residential and Commercial Consumers in the United States," Energy Systems and Policy 1.4 (1976), 305-324; A. M. Schneider, "Elasticity of Demand for Gasoline," Energy Systems and Policy 1.3 (1976), 277-285; D. J. Bjornstad, "Changes in Regional Economic Capacity Due to Projected Energy Price Changes," The Energy Journal 3.1 (1982), 35-58; G. Fishelson, "Demand for Gasoline for Usage by Passenger Cars," Resources and Energy 4 (1982), 163-172; A. Bopp and G. M. Lady, "On Measuring the Effects of Higher Energy Prices," Energy Economics (Oct. 1982), 218-224; S. A. Dahl, "Consumer Adjustment to a Gasoline Tax," Review of Economics and Statistics 61 (1979), 427-432; M. Kennedy, "An Economic Model of the World Oil Market," Bell Journal of Economics and Management Science 5.2 (1974), 540-577.

Exhibit VI-1

OVERVIEW OF POLLUTION COMPENSATION

Regime	Claimants	Primary Disbursing and Collection	Primary Payer	Secondary Payers	Ultimate Payer
TOVALOP	Government Agencies	International Tanker Owners	P&I clubs	Shipowners	Ultimate Petroleum Customer
	Spill Contractors	Pollution Federation Limited		(pays P&I insurance premiums; passes cost on to cargo owner/freight payer)	
	Third Party Claimants	(Intertanko), London (processes claim invoices, forwards claims to P&I clubs)	(provides from P&I club premiums both advance and supplemental and re-insurance)		
CRISTAL	Government Agencies	Oil Companies Institute for	Oil Cargo Owners	Oil Companies	Ultimate Petroleum Customer
	Spill Contractors	Marine Pollution Compensation	Parents or Subsidiaries	Oil Company Parents	
	Third Party Claimants	Ltd., Bermuda and London	(pays CRISTAL on basis of assessment oil)		
	TOVALOP (sometimes)	(pays off on qualified claims in excess of TOVALOP limit; levies a call on assessment oil)		(pays CRISTAL in some instances)	
CLC	Government Agencies	Very limited; no	P&I clubs	Shipowners	Ultimate Petroleum Customer
	Spill Contractors	Central organization;		(pays P&I insurance premiums; passes cost on to cargo owner/freight payer)	
	Third Party Claimants	Some minor oversight in individual governments.	(deposits liability in CLC country, pays off after review of claims)		
FUND	Government Agencies	International Maritime	FUND members	Terminal Users	Ultimate Petroleum Customer
	Spill Contractors	Organization, FUND	Terminals	Oil Companies	
	Third Party Claimants	Executive and Directorate, London	(billed by FUND on a basis of contributing oil)	(pays FUND on basis of contributing oil)	
	CLC (sometimes)	(pays off on qualified claims in excess of CLC limit; reviews claim documentation; levies call on contributing oil)			

Exhibit VI-2

WORLD TANKER FLEET OWNERSHIP AND ORDERS

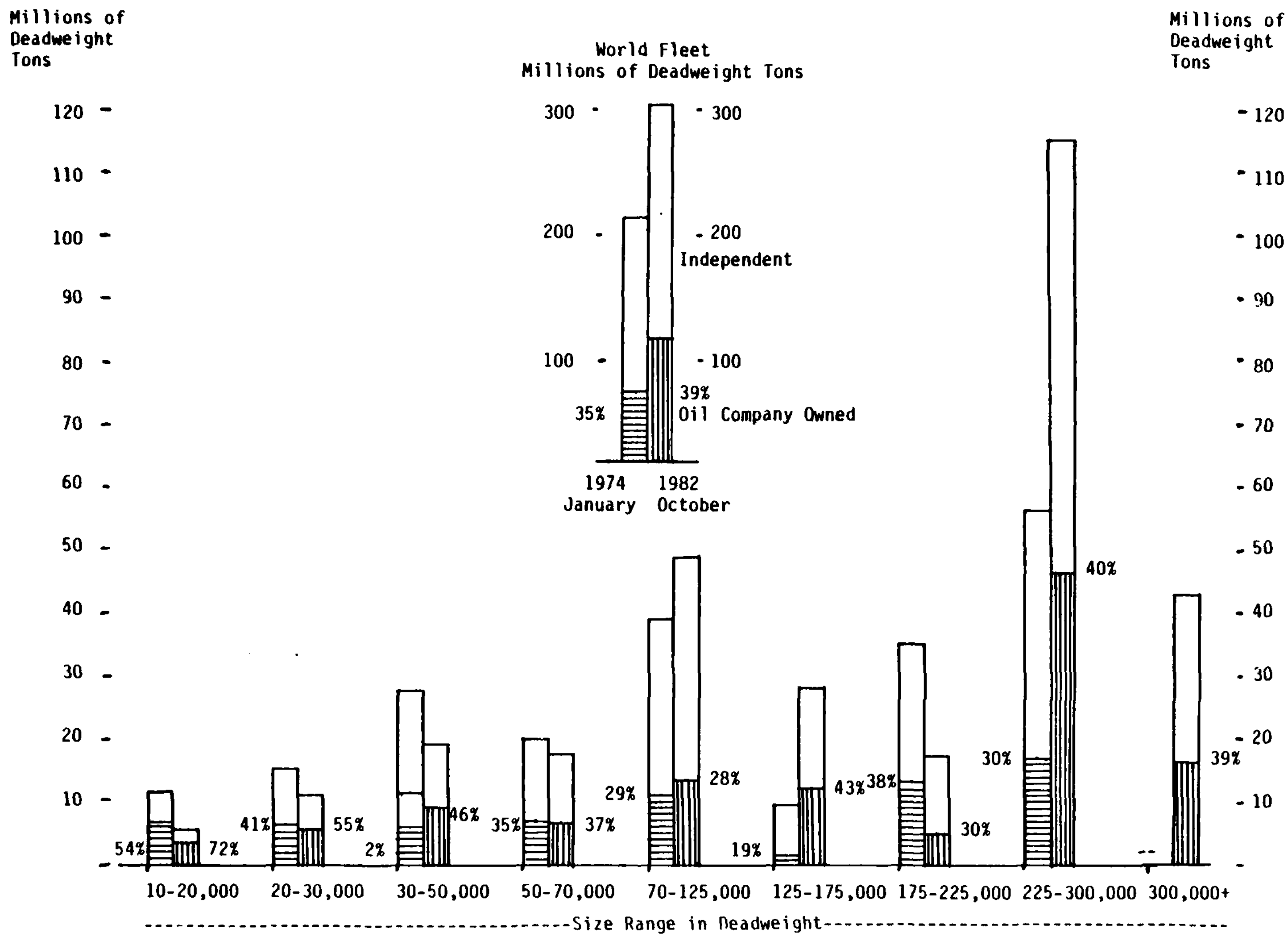
October 1982

	Existing Fleet			On Order			Percent of Existing Fleet on Order	Average Size Tanker (deadweight)	
	Ships	Total Deadweight	Percent of Fleet	Ships	Total Deadweight	Percent of Orders		In Service	On Order
Seven Major Oil Companies	437	53,302,000	18%	12	820,000	7%	1.5%	121,970	68,330
Other Oil Companies	884	65,025,000	21	96	4,164,000	36	6.4	73,560	43,380
All Oil Companies	1,321	118,327,000	39%	108	4,984,000	43%	4.2%	89,570	46,150
Independent Oil Tanker Owners	1,657	186,187,000	61	124	6,461,000	56	3.4	112,360	52,100
Total	2,978	304,514,000	100%	232	11,445,000	100%	38.1%	102,254	49,331

Source: TBS analysis of H.P. Drewry Shipping Statistics and Economics.

Exhibit VI-3

OWNERSHIP TRENDS OF THE WORLDS TANKER FLEET

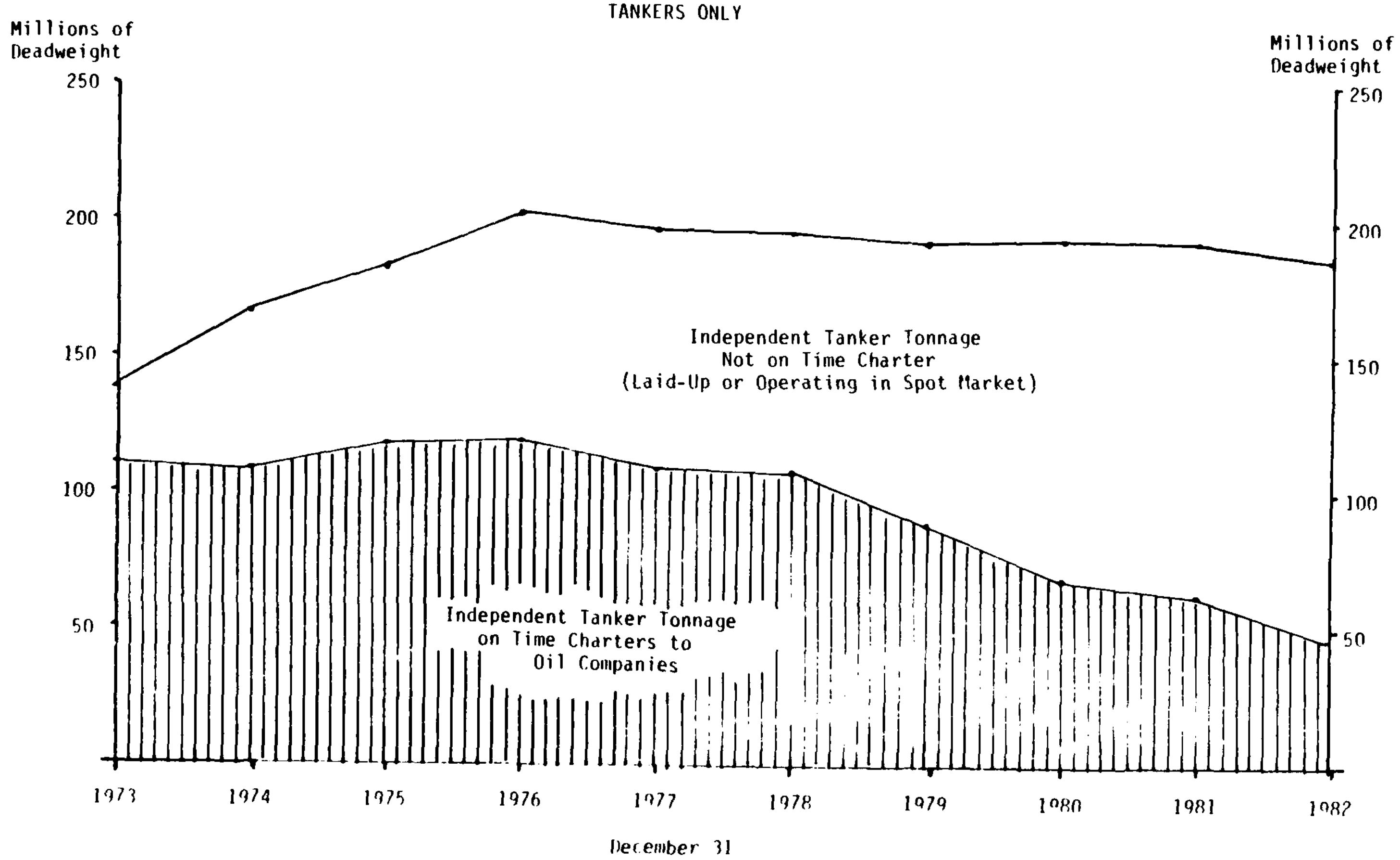


Source: TBS Analysis of H.P. Drewry Shipping Statistics and Economics

Exhibit VI-4

INDEPENDENT TANKER FLEET CHARTER POSITION
1973-1974

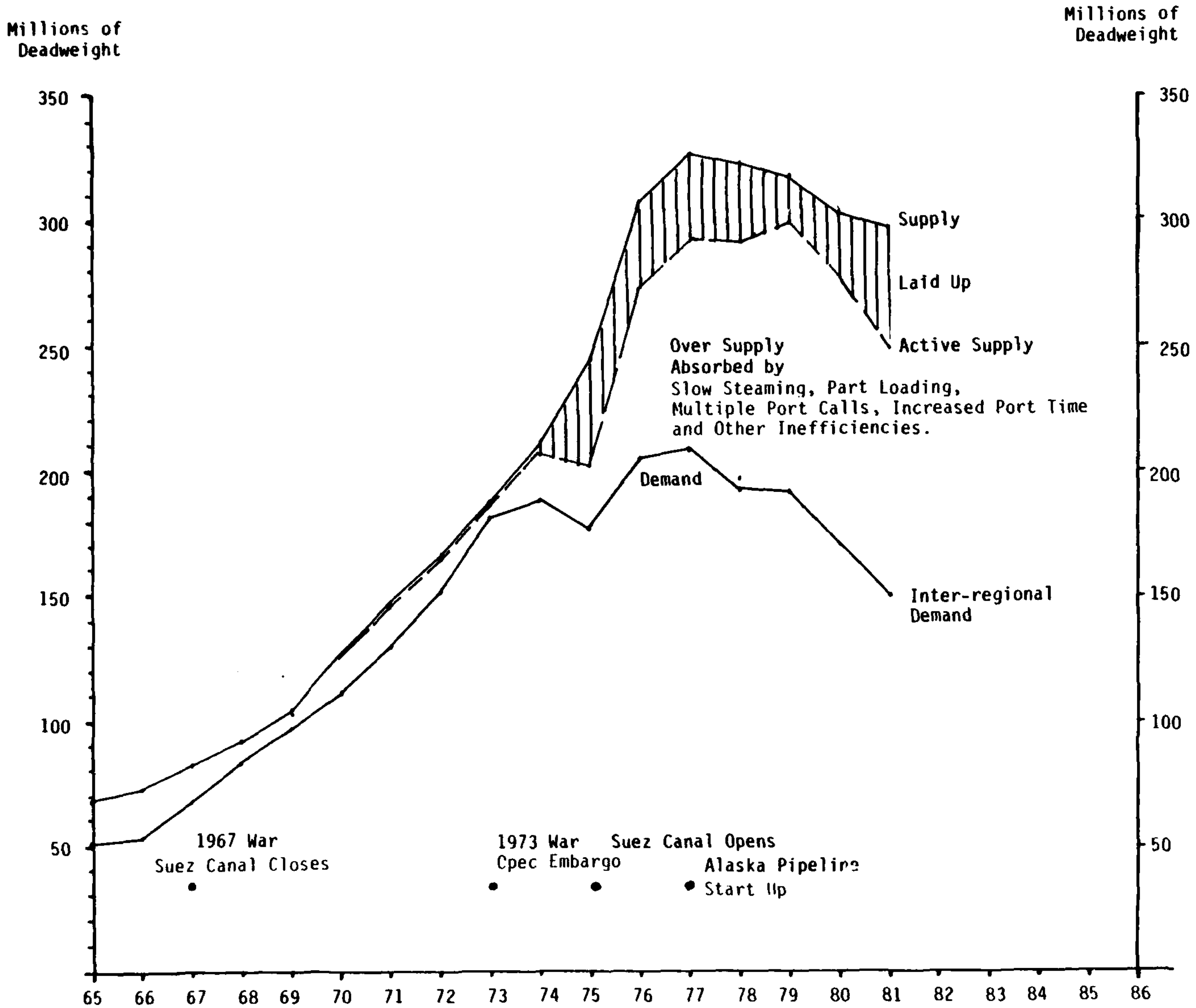
TANKERS ONLY



Source: TBS Analysis of H.P. Drewry Shipping Statistics and Economics

Exhibit VI-5

SUMMARY OF WORLD CRUDE OIL TANKER SUPPLY AND DEMAND
INTER-REGIONAL TRADE

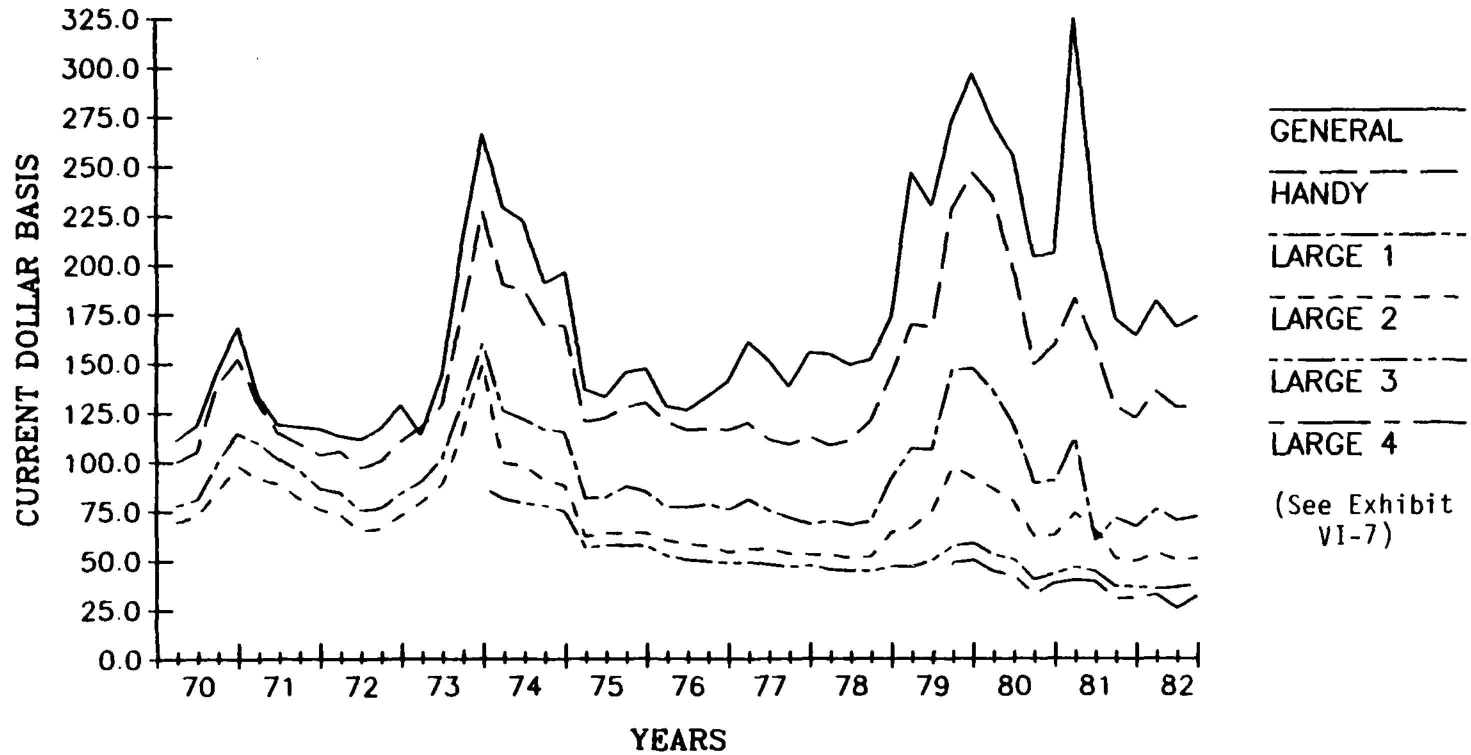


Source: TBS Analysis of B.P. and Fearnley and Egars data.

EXHIBIT VI-6

GRAPH OF TANKER AVERAGE FREIGHT RATE ASSESSMENT INDEX

1970-1982



SOURCE: OECD, MARITIME TRANSPORT AND H.P. DREWRY SHIPPING STATISTICS AND ECONOMICS.

Exhibit VI-7

AVERAGE FREIGHT RATE ASSESSMENT INDEX
(AFRA LEVELS) FOR THE WORLD TANKER FLEET

1970-1982

(current dollar basis)

		Deadweight Range						
		16,500-24,999	25,000-44,999	45,000-79,999	80,000-159,999	160,000-320,000	320,000-549,999	Basic Revenue Adjustment $ per Worldscale Point
Year		General	Handy	Large 1	Large 2	Large 3	Large 4	
1970	1	111.3	100.2	78.0	69.6			
	2	118.4	105.0	80.9	72.4			
	3	146.6	139.3	99.8	85.4			
	4	168.5	152.4	114.7	97.9			
1971	1	133.8	130.3	109.6	91.2	-		+3%
	2	118.8	114.7	101.4	88.8	-		
	3	117.6	109.3	95.6	81.3	-		
	4	116.7	103.5	86.4	75.8	-		
1972	1	113.1	105.0	84.3	73.3	-		+5%
	2	111.4	96.9	75.4	65.2	-		
	3	116.9	100.6	76.6	66.2	-		
	4	128.6	110.5	84.1	72.7	-		
1973	1	113.7	117.3	90.1	79.6	-		-2%
	2	143.9	128.5	101.8	88.7	-		
	3	210.9	176.6	129.2	113.8	-		
	4	266.0	226.6	159.9	149.4	86.8		
1974	1	228.7	189.4	125.8	99.2	81.1		
	2	222.0	186.8	121.6	97.8	78.9		No Change
	3	190.6	169.3	116.3	90.5	77.5		
	4	196.2	168.8	115.0	87.9	74.7		
1975	1	136.3	120.1	81.4	62.2	56.4		
	2	132.8	122.2	82.0	63.6	57.8		+38%
	3	145.4	127.8	87.6	64.0	57.7		
	4	147.0	129.8	84.4	63.6	57.0		
1976	1	127.9	119.9	76.8	59.8	52.1		+10%
	2	126.1	116.1	77.1	58.0	50.1		
	3	133.2	116.6	78.5	57.3	49.4		
	4	140.8	116.0	75.7	54.1	48.7		
1977	1	160.7	119.8	81.0	56.1	49.1		+2%
	2	151.2	111.2	75.1	55.5	47.8		
	3	138.3	108.8	71.7	53.4	46.8		
	4	155.3	112.5	68.3	52.7	47.4		
1978	1	154.2	108.2	69.9	52.5	45.2		+6%
	2	149.0	111.0	68.0	51.1	44.6		
	3	151.7	120.3	69.8	52.0	44.4		
	4	173.3	143.6	91.6	64.2	47.0		
1979	1	246.3	169.5	106.7	66.5	46.8	-	+2%
	2	229.8	167.9	106.2	75.2	50.3	-	
	3	272.6	228.2	146.4	97.1	57.3	48.8	
	4	296.3	246.0	147.4	91.7	58.8	50.2	
1980	1	272.0	234.4	136.1	86.1	52.8	44.4	+15%
	2	254.8	196.9	119.4	79.8	50.5	42.0	
	3	203.6	148.7	89.0	61.9	40.2	32.9	+25%
	4	205.3	159.1	90.2	62.6	43.2	38.3	
1981	1	324.2	182.5	111.6	73.8	46.5	40.0	
	2	219.8	158.6	60.1	65.3	44.2	39.0	
	3	171.9	127.7	71.3	50.8	36.7	30.5	+13%
	4	163.8	122.0	67.0	49.5	36.4	30.9	
1982	1	181.0	135.4	75.7	53.6	35.4	32.5	-7%
	2	167.8	127.3	70.1	49.9	36.4	25.6	
	3	173.4	127.4	72.3	51.1	37.7	31.8	
	4	172.0	129.4	71.5	48.5	39.8	35.9	

Source: OECD, Maritime Transport, and H.P. Drewry Shipping Statistics and Economics.

Exhibit VI-8

AVERAGE SIZE OF CARGOES

SINGLE VOYAGE CHARTERS FOR
CRUDE OIL AND RESIDUAL OIL CARGOES

December of Year

(thousands of deadweight)

Trade	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Typical 1982 Worldscale Points Paid on Spot and Short Term Charters
Persian Gulf/Red Sea to											
Western Europe/Caribbean-U.S. East Coast	88.6	102.4	152.0	168.0	142.4	146.4	190.4	183.8	151.0	115.9	51.1
Europe	-	-	-	-	-	-	-	194.4	148.5	108.7	51.1
Caribbean/U.S. East Coast	-	-	-	-	-	-	-	122.2	164.0	126.2	37.7
East, of which	42.1	62.4	73.0	83.0	98.5	117.9	129.7	131.3	158.1	120.9	37.7
Far East	-	-	-	-	-	-	-	145.4	175.1	130.7	51.1
Southeast Asia	-	-	-	-	-	-	-	99.4	93.6	97.8	51.1
Caribbean to											
U.S. East Coast	24.4	38.2	44.0	43.0	43.6	54.0	53.2	53.9	51.8	52.5	72.3
All other Destinations	28.3	36.7	30.0	39.0	48.1	40.8	56.3	60.9	62.8	59.5	72.3
Mediterranean to											
Caribbean/U.S. East Coast	35.2	43.8	65.0	63.0	67.4	81.2	83.6	103.0	79.3	80.3	72.3
Europe including Intra Mediterranean	55.8	52.9	58.0	61.0	60.0	75.2	79.2	70.0	69.7	72.3	72.3
West Africa to											
Rest of World	16.5	73.2	70.0	76.0	107.1	114.5	94.9	101.8	83.7	92.4	51.1
Western Hemisphere	50.0	63.5	72.0	89.0	97.6	100.3	74.0	-	-	-	
Indonesia to											
Rest of World	-	-	-	-	-	-	-	82.0	77.7	82.7	72.3
East Coast Mexico to											
U.S. East Coast	-	-	-	-	-	-	-	50.5	40.0	57.2	127.4
Nortwest Europe to											
U.S. East Coast	-	-	-	-	-	-	-	94.7	75.5	74.5	72.3
Northwest Europe	-	-	-	-	-	-	-	55.1	62.8	56.8	72.3
World Average	48.4	58.5	69.0	75.0	73.7	76.8	91.6	88.1	80.3	73.7	51.1

Note: This exhibit presents the average size of cargo lots; ship deadweight is larger and depends upon percent utilization of deadweight capacity.

Source: TBS analysis of H.P. Drewry Shipping Statistics and Economics.

Exhibit VI-9

COMPARISON OF ESTIMATES OF ANNUAL
P&I PREMIUMS

(dollars per gross ton)

Tanker Size		U.K. Ship Manager British-Flag[1]	World Typical TBS	Marine Insurance Company Estimate Typical Tanker[1]
Gross Tons	Deadweight			
4,600	7,500	$ 29,500 (6.40)	$ 32,500 (7.07)	$ 32,500 (7.50)
12,100	20,000	51,400 (4.25)	61,180 (5.05)	60,500 (5.00)
21,764	37,500	70,500 (3.24)	71,820 (3.30)	70,000 (3.22)
32,000	60,000	71,360 (2.23)	80,864 (2.53)	72,000 (2.25)
47,400	98,000	86,000 (1.81)	85,120 (1.80)	95,000 (2.00)
61,500	120,000	85,000 (1.38)	94,430 (1.54)	97,000 (1.58)
132,500	265,000	117,000 (.88)	123,690 (.93)	145,750 (1.10)

[1]Adjusted by TBS to coincide with tanker size ranges utilized for the tanker cost analysis.

Exhibit VI-10

HIGH STANDARD SAMPLE OF TOTAL P&I
COSTS FOR BRITISH-FLAG TANKERS

(1983 dollars)

Deadweight	Gross Tonnage (GRT)	Advance Calls		Supplementary Calls (backcalls) Cost	Cost	
		Rate per Gross Ton	Cost		Total	Per GRT
500	300	$47.00	$14,100	$ 3,525	$17,625	$58.75
10,000	6,000	4.50	27,000	6,750	33,750	5.63
20,000	12,000	3.40	40,800	10,200	51,000	4.25
70,000	35,000	1.25	62,500	15,625	78,125	2.23
90,000	58,000	1.10	63,800	15,950	79,750	1.38
200,000	100,000	.70	70,000	17,500	87,500	.88

Note: These costs were developed for British-flag tankers operated to a high standard. Premium costs for average non-British tankers are higher. Premiums can be at least double these amounts for tankers with lower crew competence and records of safety.

Source: British ship managing company. Supplementary calls were assumed to be 25 percent of the advance call.

Exhibit VI-11

SUMMARY OF P&I SHIPOWNER LIABILITY FOR OIL POLLUTION
FOR 1970-1980 PERIOD

1982 dollars

Total Ship Years	$	76,250	
Total Gross Ton Years		1,699,700,000	
Total Shipowner Liability		347,400,000	
Shipowner Liability		211,200,000	Over $250,000 per incident
Shipowner Liability		136,200,000	Under $250,000 per incident
Liability Cost per Ship-Year	$	4,556	
Liability Cost per Gross Ton-Year	$	0.208	

Source: TBS analysis of Pollution Incidents (see Chapter VII) and Exhibit VI-12.

Exhibit VI-12

SUMMARY OF P&I AND ITIA
PAID AND ESTIMATED CLAIMS
INCURRED BY TANKERS ENTERED
IN THE INDEPENDENT GROUP OF
P&I CLUBS AND ITIA

(millions of dollars)

	P&I Payments[1] For Claims Under $250,000	Price Inflation to 1982	P&I Payments $ 1982
1970	$2.3	2.60	$ 4.9
1971	3.6	2.43	8.7
1972	4.1	2.20	9.0
1973	6.5	1.93	12.5
1974	9.5	1.76	16.7
1975	8.3	1.56	12.9
1976	10.2	1.52	15.5
1977	9.4	1.39	13.1
1978	8.4	1.20	10.1
1979	13.2	1.09	14.4
1980	14.4	1.00	14.4
	89.9		136.2

[1]Source: Review of the limits of liability and compensation in the 1969 Civil Liability Convention and the 1971 FUND Convention. Submission by the Internation Group of P&I Associations to the 50th Session of the IMO Legal Committee, January 1983.

Note: In 1970-1975 costs are for part of the world's tanker fleet.

Exhibit VI-13

SUMMARY OF INTERNATIONAL TANKER REVENUES AND COSTS

(millions of dollars)

Deadweight	Revenues	Total Cost	Operating Cost	P&I Premium Cost
7,500	$3.336	$2.143	$1.837	$0.033
20,000	5.300	5.565	4.400	0.061
37,500	6.703	9.185	6.380	0.072
60,000	6.701	9.556	6.734	0.081
90,000	7.395	9.177	7.342	0.085
120,000	8.401	10.550	8.210	0.094
265,000	14.152	18.676	14.416	0.124

Source: Exhibits VI-15 and VI-16.

Exhibit VI-14

SUMMARY OF INTERNATIONAL OIL TANKER
CHARACTERISTICS AND COSTS

(dollars in millions)

Tanker Deadweight in Long Tons	7,500	20,000	37,500	60,000	90,000	120,000	265,000
Gross Tonnage	4,500	12,100	21,764	32,000	47,400	61,500	132,500
Horsepower	2,500	9,600	12,500	18,000	20,000	25,000	36,000
Propulsion	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Steam
Fuel Consumption (barrels per day)							
At Sea	60 (IFO)	305 (IFO)	430 (IFO)	470 (HFO)	550 (HFO)	550 (HFO)	1,155 (HFO)
In Port, Cargo, Heating, Pumping, Maneuvering	10 (MDO)	31 (IFO)	35 (IFO)	70 (IFO)	150 (IFO)	105 (IFO)	310 (HFO)
Generating	12 (IFO)	19 (MDO)	25 MDO)	30 (MDO)	35 (MDO)	35 (MDO)	40 (IFO)
Speed, standard	12.0	15.5	15.5	16.0	16.0	16.0	15.3
<u>Capital Costs</u>							
1972 Original	$ 4.0	$12.6	$13.5	$16.2	$19.8	$23.7	$35.7
1975 Original	5.7	18.0	19.6	23.5	28.7	34.4	59.5
1979 Original	7.2	21.0	22.5	27.0	33.0	39.5	68.5
1982 Original	10.2	31.0	32.4	20.0	40.0	42.0	75.0
1977-Built Second-Hand Value in 1982	2.0	8.0	26.0	15.0	7.0	4.0	4.5
Average Age of Ships in Size Range (years)	24	24	15	13	10	8	7
Average Year Built	1958	1958	1967	1969	1972	1974	1975
Original Cost	-	-	-	-	$19.8	$32.0	$59.5
Depreciated Value	$ 3.0	$ 3.0	$ 6.0	$15.0	$ 9.0	$ 7.7	$14.5
Insured Value	1.0	8.0	26.0	15.0	9.0	7.7	14.5

[1]In depressed markets, ships may operate at lower speeds if charter terms permit.

Exhibit VI-15

INTERNATIONAL OIL TANKER TYPICAL ANNUAL OPERATING COSTS

Calendar Year 1982

	Deadweight Tons						
	7,500	20,000	37,500	60,000	90,000	120,000	265,000
<u>Fixed Costs</u>							
Return on Assets (8 percent)	80,000	640,000	2,080,000	1,200,000	720,000	616,000	1,160,000
Depreciation	100,000	400,000	600,000	1,500,000	990,000	1,600,000	2,975,000
Administration & Management	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Total Fixed	305,000	1,165,000	2,805,000	2,825,000	1,835,000	2,341,000	4,260,000
<u>Vessel Operating Expenses</u>							
Wages & Allowances[1]	344,000	567,000	567,000	670,000	831,600	858,000	968,000
Subsistence	33,000	55,000	55,000	56,000	56,000	56,000	59,000
Stores, Supplies Equipment	110,000	186,000	226,000	259,000	286,000	293,000	217,500
Maintenance & Repair	140,000	266,000	286,000	319,000	346,000	366,000	485,000
Insurance							
War Risk	-	5,500	5,500	5,400	7,600	8,700	14,900
Hull—Premium & Absorption	15,000	80,000	260,000	225,000	135,000	115,000	232,200
P&I	32,500	61,000	72,000	81,000	85,100	94,400	124,000
Strike/Lost Charter Insurance	10,000	10,000	14,600	11,600	15,600	17,500	20,900
Uninsured Losses	10,000	15,000	20,000	35,000	45,000	55,000	70,000
Subtotal	694,500	1,245,500	1,506,100	1,662,000	1,807,900	1,863,000	2,191,500
<u>Voyage Expenses Based on Total Operating</u>							
Service Days	345	345	345	350	350	350	350
At Sea	241	255	295	315	315	315	315
In Port	104	90	50	35	35	35	35
Voyages Per Year	52	45	25	11	10	9	8
Maximum Cargo Tons per Year	370,500	855,000	890,625	627,000	855,000	1,026,000	2,014,000
<u>Fuel Costs:</u>							
MDO (Maine Diesel)[1]	659,736	275,310	362,250	441,000	514,500	514,500	-
IFO (Intermediate Fuel)[2]	106,164	1,727,730	3,472,200	132,000	141,750	99,225	588,000
HFO (Heavy Fuel Oil)[3]	-	-	-	3,789,150	3,923,325	4,591,125	9,928,887
Total	765,900	2,003,040	3,834,450	4,362,150	4,579,575	5,204,850	10,516,877
Port, Pilot, Agent, and Canal Costs per Voyage	7,000	25,000	40,000	60,000	90,000	120,000	200,000
Cost per Year	364,000	1,125,000	1,000,000	660,000	900,000	1,080,000	1,600,000
Subtotal Operating and Voyages Expenses	1,826,592	4,372,540	6,340,550	6,684,150	7,287,475	8,148,450	14,308,377
Charter Broker Fees	11,400	27,328	39,628	50,131	54,656	61,113	107,313
Total Operating & Voyage Expense	1,837,992	4,399,868	6,380,178	6,734,281	7,342,131	8,209,563	14,415,690
P&I Premium Current	32,500	61,000	72,000	81,000	85,100	94,400	124,000
P&I Premium as Percent of Cost Above	1.8%	1.4%	1.1%	1.2%	1.2%	1.1%	0.9%
Additional P&I Premium to Flat $50 million Tranche[4]	5,296	5,808	9,794	13,760	9,480	11,070	19,875
Additional P&I Premium as Percent[4]	0.29%	0.13%	0.15%	0.20%	0.13%	0.13%	0.14%

[1]At $42 per barrel.
[2]At $27 per barrel.
[3]At $26.50 per barrel.
[4]Source: Exhibit VI-12.

Source: TBS.

Exhibit VI-16

OPERATING AND VOYAGE
REVENUE AND COST COMPARISON FOR TYPICAL TANKERS

Deadweight	Ws Prevailing	Typical Voyage Length One Way	Voyages per Year	Ton-Miles per Deadweight	Revenue Based on 95% Capacity Utilization	Operating & Voyage Cost per Ship Year	Net Contribution to Fixed Costs	Fixed Costs	Net Profit
7,500	300	667	52	34,684	$3,336,167	$1,837,992	$1,498,175	$ 305,000	$1,193,175
20,000	173	1,054	45	47,430	5,300,681	4,399,868	900,813	1,165,000	(264,187)
37,500	127	2,195	25	54,875	6,703,427	6,380,178	323,249	2,805,000	(2,481,751)
60,000	72	5,498	11	60,478	6,701,446	6,734,281	(32,835)	2,825,000	(2,857,855)
90,000	55	6,048	10	60,480	7,394,587	7,342,131	52,456	1,835,000	(1,782,544)
120,000	45	6,720	9	60,480	8,401,392	8,209,563	281,829	2,341,000	(2,059,171)
265,000	36	7,229	8	57,832	14,151,548	14,415,690	(262,142)	4,260,000	(4,522,142)

Ws Flat rates assurred of $.0026 per mile for voyages over 5,000 miles, $.0027 for voyages of 2,000 miles, $.0030 for voyages of about 1,000 miles, and $.0045 for voyages of about 700 miles.

Exhibit VI-17

SUMMARY OF U.S.-FLAG OIL TANK SHIPS
CHARACTERISTICS AND COSTS

Type	Tug Barge	Tug Barge	Integrated Tug Barge	Tanker	Tanker	Tanker	Tanker	Tanker	Tanker
Deadweight	7,500	30,000	37,500	20,750	37,500	50,000	90,000	120,000	265,000
Gross Tonnage				12,200	20,625	27,460	47,368	57,700	132,000
Horsepower	1,940	5,500	14,000	7,240	15,000	17,000	20,000	22,000	32,000
Propulsion	Diesel	Diesel	Diesel	Steam	Diesel	Steam	Steam	Steam	Steam
Fuel Consumption									
At Sea	58 (MDO)	133 (MDO)	314 (IFO)	290 (HFO)	390 (HFO)	575 (HFO)	690 (HFO)	765 (HFO)	1,155 (HFO)
In Port, Cargo, Heating, Pumping, Maneuvering	10 (MDO)	22 (MDO)	35 (IFO)	60 (HFO)	40 (HFO)	100 (HFO)	123 (HFO)	165 (HFO)	310 (HFO)
Generating	6 (MDO)	8 (MDO)	15 (IFO)	10 (HFO)	20 (IFO)	25 (HFO)	30 (HFO)	35 (HFO)	40 (HFO)
Speed (knots)	7	7	14	14.5	16.0	16.0	16.0	16.0	16.0
Capital Costs (non-Subsidized)									
Market Value (millions)	$2.4	$17.1	$40.3	$2.5	$45.0	$28.0	$41.0	$45.0	$61.2
1982 Construction Cost	$4.5	$20.0	$60.0	N.A.	$69.4	$79.0	$92.0	$109.0	$189.0

MDO = Marine Diesel Oil (No. 2 distillate).
IFO = Intermediate Fuel Oil (No. 4 distillate).
HFO = Heavy Fuel Oil.

Source: TBS and Maritime Administration data.

Exhibit VI-18

U.S.-FLAG OIL VESSEL TYPICAL ANNUAL OPERATING COSTS

Calendar Year 1982

	Vessel Type and Deadweight								
	Barge 7,500	Barge 30,000	Barge 37,500	Tanker 20,750	Tanker 37,500	Tanker 50,000	Tanker 90,000	Tanker 120,000	Tanker 265,000
Fixed Costs									
Return on Asset 15 percent	360,000	2,565,000	6,045,000	375,000	5,625,000	4,200,000	6,150,000	6,750,000	7,334,000
Administration & Management	100,000	200,000	200,000	200,000	200,000	300,000	350,000	325,000	300,000
Total Fixed	460,000	2,765,000	6,245,000	575,000	5,825,000	4,500,000	6,400,000	7,075,000	7,634,000
Vessel Operating Expenses									
Wages & Allowances	267,000	680,000	852,000	2,344,000	2,500,000	2,675,000	2,700,000	2,775,000	2,850,000
Subsistence	24,000	20,000	45,000	120,000	87,000	90,200	90,200	93,675	97,090
Stores, Supplies Equipment	59,000	53,000	118,000	184,000	160,000	190,000	220,000	225,000	275,000
Maintenance & Repair	250,000	305,000	409,000	620,000	600,000	785,000	945,000	1,100,000	1,125,000
Insurance									
War Risk	-	-	-	-	-	-	-	-	-
Hull—Premium & Absorption	100,000	262,500	295,500	33,000	389,000	448,000	655,000	720,000	1,005,000
P&I	45,000	70,000	90,000	100,000	125,000	130,400	150,400	165,000	200,000
Strike/Lost Charter Insurance	5,000	10,000	20,600	10,000	20,000	25,000	30,000	40,000	30,000
Uninsured Losses	10,000	15,000	15,000	35,000	20,000	25,000	30,000	40,000	50,000
Subtotal	840,000	1,423,500	1,842,500	4,446,000	3,901,000	4,368,600	4,820,600	5,158,625	5,632,090
Voyage Expenses Based on Total Operating									
Service Days	350	350	350	350	350	350	350	350	350
At Sea	260	290	285	285	275	302	314	315	320
In Port	90	60	65	65	75	48	36	35	30
Voyages Per Year	45	30	30	30	30	24	18	15	12
Maximum Cargo Tons per Year	337,500	900,000	1,125,000	456,000	1,068,750	1,140,000	1,539,000	1,710,000	3,021,000
Fuel Costs:									
MDO (Maine Diesel)[1]	687,000	1,522,000	-	-	-	-	-	-	-
IFO (Intermediate Fuel)[2]	-	-	2,619,000	-	81,000	-	-	-	-
HFO (Heavy Fuel Oil)[3]	-	-	-	2,386,000	3,078,000	-	5,801,000	-	10,412,000
Total	687,000	1,622,000	2,619,000	2,386,000	3,109,000	4,929,000	5,801,000	6,831,000	10,412,000
Port, Pilot, Agent, and Canal Costs per Voyage	3,000	7,500	10,000	15,000	20,000	25,000	30,000	35,000	40,000
Cost per Year	135,000	225,000	300,000	450,000	600,000	600,000	540,000	525,000	480,000
Subtotal Operating and Voyages Expenses	1,662,000	3,270,500	4,761,500	7,282,000	7,610,000	9,897,600	11,161,600	12,514,625	16,524,090
Charter Broker Fees	10,000	21,000	30,000	40,000	45,000	60,000	65,000	85,000	107,000
Total Operating & Voyage Cost	1,672,000	3,291,500	4,791,500	7,322,000	7,655,000	9,957,600	11,226,600	12,599,625	16,631,090
P&I Premium Current	45,000	70,000	90,000	100,000	125,000	130,400	150,400	165,000	200,000
P&I Premium as Percent of Cost Above	2.7%	2.1%	1.9%	1.4%	1.6%	1.3%	1.3%	1.3%	1.2%

[1]At $38 per barrel.
[2]At $27 per barrel.
[3]At $26.50 per barrel.

Source: MarAd 1982 Estimated Annual Operating Costs for U.S. Flag Tankers and TBS Analysis.

Exhibit VI-19

U.S. TANK VESSEL ESTIMATED RATES, REVENUES, AND COSTS
FOR 1982--FULL UTILIZATION

Vessel	Deadweight	Total Cost Recovery AR Rate Required	Operating and Voyage Cost Recovery AR Rate Required	Typical Average Voyage Length (one way)	Voyages per Year	Ton-Miles per Deadweight	Full Utilization Operating and Voyage Costs	Full Utilization Fixed Costs	Full Utilization Total Cost
Barge	7,500	181	142	485	45	21,825	$ 1,672,000	$ 460,000	$ 2,132,000
Barge	30,000	148	80	812	30	24,360	3,291,500	2,765,000	6,056,500
Barge	37,500	162	70	1,596	30	47,880	4,791,500	6,245,000	11,036,500
Tanker	16,000	276	256	1,653	30	47,111	7,322,000	575,000	7,897,000
Tanker	37,500	189	107	1,760	30	50,160	7,655,000	5,825,000	13,480,000
Tanker	50,000	138	95	2,415	24	55,062	9,957,000	4,500,000	14,457,600
Tanker	90,000	90	57	3,349	18	57,268	11,226,600	6,400,000	17,626,600
Tanker	120,000	75	48	4,032	15	57,456	12,599,625	7,075,000	19,674,625
Tanker	265,000[2]	42	28	5,119	12	58,357	16,631,090	7,634,000	24,625,090

[1]Revenue calculations based on typical flat rate AR100 American Rates (AR) rate levels of $.0072 per mile for 500 miles, $.0056 per mile for 800 miles, $.0038 per mile for 1,600 miles or more.

[2]Assumes tanker is engaged in Jones Act trade full-time. These ships can operate in the Jones Act up to six months per year.

Exhibit VI-20

COMPARISON OF SELECTED INTERNATIONAL
AND U.S. TANKER COSTS

Deadweight	Operating Cost		P&I Component		P&I as Percent of Operating Cost	
	International	United States	International	United States	International	United States
7,500[a]	1,838,000	1,672,000	32,500	45,000	1.8%	2.7%
37,500	6,380,178	7,655,000	72,000	125,000	1.1	1.6
90,000	7,342,131	11,226,600	85,100	150,400	1.2	1.3
265,000	14,415,690	16,631,090	124,000	200,000	0.9	1.2

[a]Foreign vessel is a self-propelled tanker, U.S. vessel is a tug and barge.

Source: Exhibits VI-16 and VI-18

Exhibit VI-21

COMPARISON OF PETROLEUM PRODUCTS COST MARGIN AND CAPACITY

FOR ALL PETROLEUM PRODUCTS

1977

	Operating Expenses as Percent of Sales	Capacity in Barrels (thousands)	Capacity Percent	Comment
Bulk Stations	9.8%	1,582	2%	Small, under 50,000 barrels capacity
Bulk Terminals	2.9	79,994	98	Large, over 50,000 barrels capacity
Total	5.0%	81,576	100%	

Source: TBS analysis; Bureau of Census, Petroleum Bulk Stations and Terminals, 1977.

Exhibit VI-22

KEY FINANCIAL MEASURES FOR PETROLEUM TERMINALS

ALL PETROLEUM PRODUCTS

1977

	Operating Expenses as Percent of Sales	Employees per Terminal	Operating Expenses per Terminal	Average Barrels Handled per Year	Operating Expense per Barrel
Bulk Stations	9.8%	6	$142,401	52,800	$2.69
Bulk Terminals	2.9	19	741,734	1,315,800	.56
Total	5.0%	7	$211,600	198,650	$1.065

Source: TBS analysis; Bureau of Census, Petroleum Bulk Stations and Terminals, 1977.

Exhibit VI-23

SAMPLE OF PERSISTENT OIL CAPACITY AT SELECTED U.S. PORTS

	Oil Companies		Utilities		Industries		Municipalities	
	Thousands of Barrels	Number of Operators	Thousands of Barrels	Number of Operators	Thousands of Barrels	Number of Operators	Thousands of Barrels	Number of Operators
Portland, Maine	3,450 crude oil pipeline co.	1	-		-		-	
Boston, Massachusetts	148 fuel oil	1	54 fuel oil	2	21 fuel oil	2	-	
New York, New York	20,985 crude oil 205 fuel oil	3 5	1,474 fuel oil	5	337 fuel oil	12	129 fuel oil	6
Delaware River	14,672 crude oil	7	1,377 fuel oil	2	433 fuel oil	9	167 fuel oil	1
Tampa, Florida	-		1,375 fuel oil	2	183 fuel oil	2	-	
Houston, Texas	9,413 crude oil 2,520 fuel oil	5 1	-		461 fuel oil	3	1 fuel oil	1
San Francisco, California	510 fuel oil	1	619 fuel oil	1	-		-	1
Total	51,903	24	4,899	12	1,435	28	297	8
Average Capacity per Receiver	2,163		408		51		37	
Likely FUND Contributions	Yes		Yes		Few		Few	
Sample FUND Liability	91%		9%		0%		0%	

Note: This exhibit understates oil company contributions due to incomplete data on oil refiner crude oil storage capacity. In addition, refinery residual oil capacity has been excluded because these facilities primarily ship and do not receive cargos.

Source: TBS analysis of Army Corps of Engineer Port Series data.

Exhibit VI-24

ESTIMATED 1982 P&I PREMIUM COST FOR OIL POLLUTION LIABILITY
FOREIGN-FLAG AND U.S.-FLAG TANKERS IN DOMESTIC TRADE
75% CAPACITY UTILIZATION

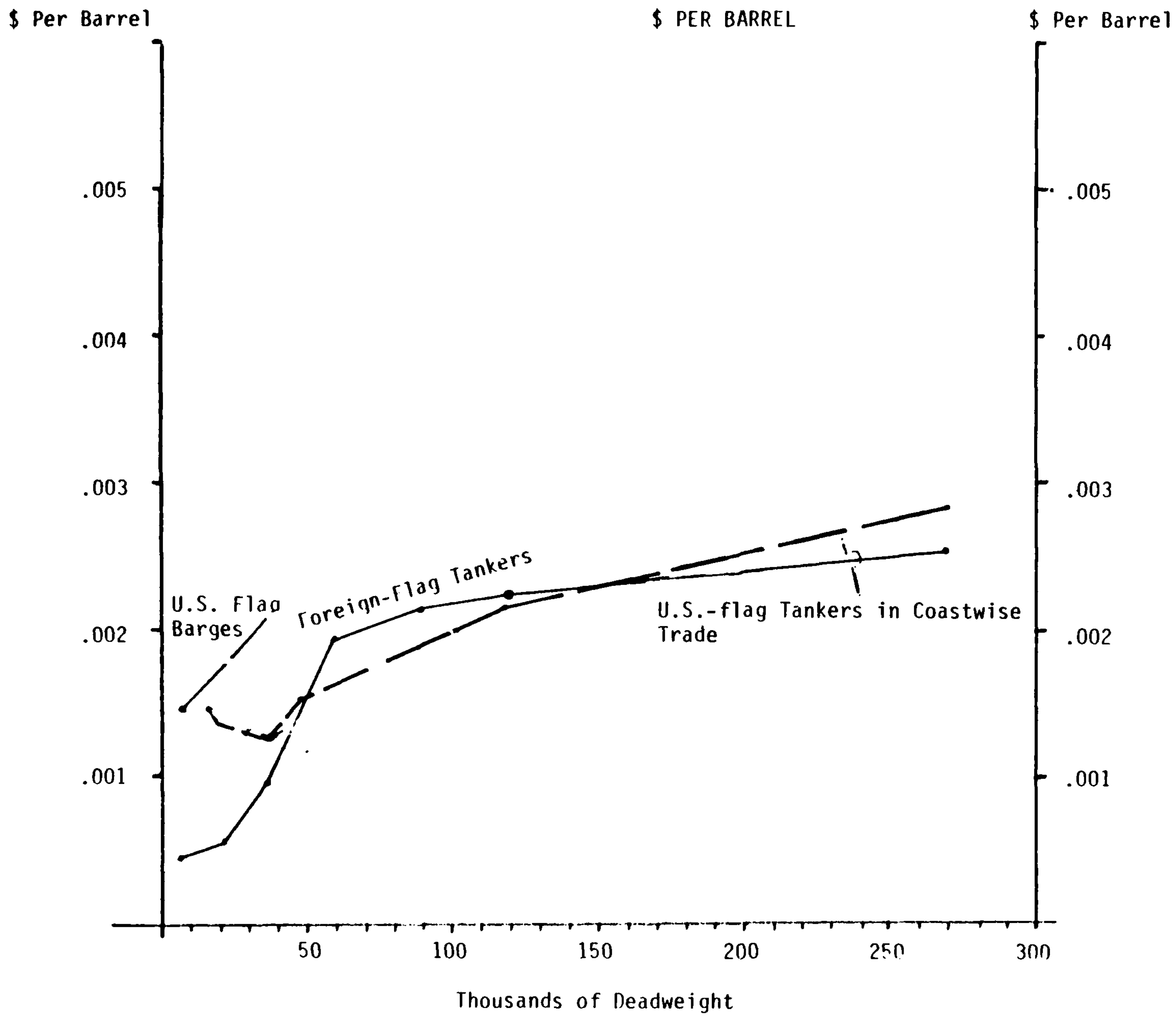


Exhibit VI-25

INTERNATIONAL TANKER ESTIMATED CURRENT P&I PREMIUM COST PER BARREL FOR OIL POLLUTION LIABILITY ESTIMATED AT AVERAGE ANNUAL COST OF $.20 PER GRT

Deadweight	Gross Tonnage	Pollution Premium Component	Cargoes per Year	Minimum Cost per Barrel[1]	Typical Cost per Barrel— 75 Percent Tanker Utilization[2]
7,500	4,500	$ 900	52	$.00035	$.00046
20,000	12,000	2,400	45	.00040	.00053
37,500	21,764	4,353	25	.00070	.00093
60,000	32,000	6,400	11	.00146	.00195
90,000	47,500	9,500	10	.00159	.00212
120,000	61,500	12,300	9	.00171	.00228
265,000	132,500	26,500	8	.00188	.00251

[1] Based on .95 of deadweight available for cargo, 7 barrels per metric ton.
[2] To recognize part cargoes, voyage delays, slow-speed operations, etc.

Exhibit VI-26

DOMESTIC TANK VESSELS IN COASTWISE TRADE
ESTIMATED CURRENT P&I PREMIUM COST PER BARREL FOR OIL POLLUTION LIABILITY
ESTIMATED AT AVERAGE ANNUAL COST OF $.34 PER GRT FOR SHIPS AND $.68 PER GRT FOR BARGES

Ship Type	Deadweight	Gross Tonnage	Pollution Premium Component	Cargoes per Year	Minimum Cost per Barrel[1]	Typical Cost per Barrel-- 75 Percent Tanker Utilization[2]
Tug/Barge	7,500	3,750	$ 2,550	45	$.00109	$.00145
Tug/Barge	20,000	15,000	10,200	30	.00161	.00215
Tug/Barge	37,500	17,500	11,900	30	.00151	.00202
Tanker	16,000	10,200	3,468	30	.00109	.00145
Tanker	20,750	12,200	4,148	30	.00100	.00133
Tanker	37,500	20,625	7,013	30	.00094	.00125
Tanker	50,000	27,460	9,336	24	.00117	.00156
Tanker	90,000	47,368	16,105	18	.00140	.00187
Tanker	120,000	57,700	19,618	15	.00164	.00219
Tanker	265,000	132,500	45,050	12	.00213	.00284

[1]Based on .95 of deadweight available for cargo, 7 barrels per metric ton.
[2]To recognize part cargoes, voyage delays, slow-speed operations, etc.

Exhibit VI-27

SUMMARY OF ESTIMATED SHIPOWNER INCREMENTAL COST
TO RAISE SHIPOWNER LIABILITY ABOVE CURRENT LEVELS
ALTERNATIVE COSTS PER GROSS TON AND PER TANKER

1982 dollars

Case	Shipowner Liability		Shipowner Liability ($ millions)	Dollars per GRT Year	Dollars per Tanker Year	Additional Dollars per GRT Year	Additional Dollars per Tanker Year
	Minimum	Maximum					
Base	$0	$10	$211.2	$0.126	$2,770	-	-
A	1	20	286.7	0.172	3,760	$0.046	$ 990
B	5	20	312.1	0.187	4,092	0.061	1,322
C	5	35	340.1	0.204	4,460	0.078	2,190
D	10	50	388.8	0.233	5,099	0.107	2,329
E	50	50	443.3	0.265	5,814	0.139	3,044

Note: This exhibit presents the base and additional costs for shipowner oil pollution liability for incidents with costs in excess of $250,000. Additional liabilities would be incurred for spills under $250,000. Cases A through E are fully discussed in Part I.

Exhibit VI-28

ADDITIONAL COST FOR SHIPOWNER
OIL POLLUTION LIABILITY
PER GRT BASIS (PER TANKER BASIS)

based on 1970 to 1980 experience

Deadweight		7,500	37,500	60,000	120,000	265,000
Gross Tonnage		4,500	21,764	32,000	61,500	132,500
Base P&I Premium		$32,500	$72,000	$81,000	$94,400	$124,000
Additional Cost	A	$ 207 (990)	$ 1,001 (990)	$ 1,472 (990)	$ 2,829 (990)	$ 6,095 (990)
	B	275 (1,322)	1,328 (1,322)	1,950 (1,322)	3,750 (1,322)	8,083 (1,322)
	C	251 (2,190)	1,698 (2,190)	2,496 (2,190)	4,797 (2,190)	10,335 (3,190)
	D	482 (2,329)	2,329 (2,329)	3,424 (2,329)	6,581 (2,329)	14,178 (3,329)
	E	626 (3,044)	3,025 (3,044)	4,448 (3,044)	8,549 (3,044)	18,418 (3,044)

Note: This exhibit presents the base and additional costs for shipowner oil pollution liability for incidents with costs in excess of $250,000. Additional liabilities would be incurred for spills under $250,000. Cases A through E are fully discussed in Part I.

Exhibit VI-29

HISTORICAL SIZE OF THE WORLD'S PETROLEUM TANK VESSEL FLEET

gross tons in millions

Year	Oil Tanker		Combination One/Oil in Tanker Trade		Total Fleet	
	Number	GRT	Number	GRT	Number	GRT
	6,100	86.1	150	6.1	6,250	92.2
1971	6,300	96.1	210	9.5	6,510	105.6
1972	6,500	105.1	245	12.6	6,745	117.7
1973	6,600	115.4	250	14.3	6,860	129.7
1974	6,750	129.5	180	10.5	6,930	140.0
1975	6,850	150.1	150	8.8	7,000	158.9
1976	7,000	168.2	217	13.0	7,217	181.2
1977	7,000	174.1	208	12.9	7,208	187.0
1978	7,000	175.0	230	14.5	7,230	189.5
1979	7,000	174.2	180	11.1	7,180	185.3
1980	7,000	175.0	120	7.6	7,120	182.6
Total During Period	74,100	1,548.8	2,150	120.9	76,250	1,669.7

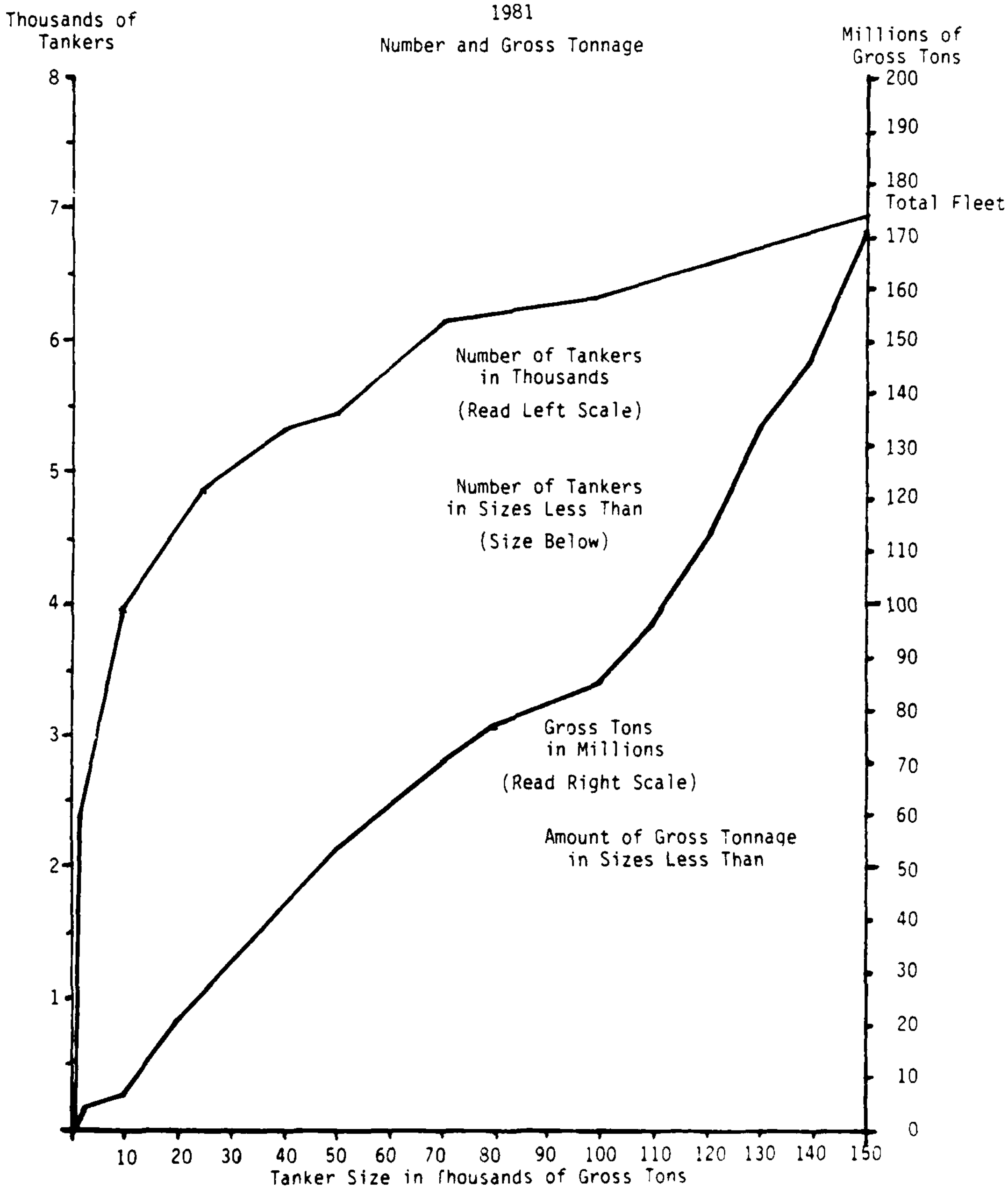
Source: OECD Maritime Statistics and TBS.

Exhibit VI-30

CUMULATIVE DISTRIBUTION OF PETROLEUM TANKER FLEET

1981

Number and Gross Tonnage



Source: Lloyd's Register of Shipping <u>Statistical Tables</u>.

Exhibit VI-31

SUMMARY OF FUND CONTRIBUTIONS PER CONTRIBUTING OIL BARREL

Annual Fund Liability (millions)	U.S. Liability at 29.6% (millions)	U.S. Contributing Oil—1981 (million metric tons)	U.S. Contribution per Barrel[1]
$ 10.0	$ 3.0	443.6	$.0010
20.0	5.9	443.6	.0018
30.0	8.9	443.6	.0029
40.0	11.8	443.6	.0038
50.0	14.8	443.6	.0048
Estimated 1970–1980			
Average: $21.0	$ 6.2	443.6	$.0021

[1]Adjusted to include $1.5 million initial contribution.

VII. HISTORICAL OIL SPILL ANALYSIS

A. BACKGROUND

Conclusions on the merits of possible U.S. ratification of CLC/FUND must be based in part on examination of the history of worldwide tanker spill claims. This chapter describes the rationale behind such an analysis, outlines the development of an historical oil spill claims database, presents and interprets aggregate statistics from that database, performs hindcast analysis of a hypothetical breakdown of liability and compensation, and investigates possible statistical relationships between oil spill variables.

There have been numerous attempts during the past decade or so to perform statistical analyses of oil spill incidents. These analyses range from simple tabulations of spill events around the world, to more sophisticated probabilistic studies of the key variables of this problem. For instance, several studies have attempted to derive probability distributions on the number of oil spills, as well as on the volume of a spill in an area as a function of the amount of oil-related activity in that area. The throughput of oil in an area has been typically used as such a descriptor, although other parameters, such as the number of port calls, have been considered.[1]

A cursory glance at the literature cited above reveals that little or nothing regarding the statistical analysis of oil spill claims has been published to date. Smets, an analyst at the Organization for Economic Cooperation and Development (OECD)[2] has recently shed some light on this issue by tabulating statistics from 148 worldwide spills, identified by the P&I Clubs for OCIMF, with claims above $0.25 million per spill. However, his analysis does not investigate possible relationships between key problem variables (such as the relationship of spill claim versus ship size or spill size). An article by White and Nichols of TOVALOP[3]

---

[1]A review of the most important papers in this area is provided. in G.G. Tharakan and H.N. Psaraftis, "A Critical Review of Oil Spill Risk Analysis," proceedings, OCEANS' 81 conference, Boston, September 1981.

[2]H. Smets, "Economic Implications of Various Compensation Limits for Oil Pollution Claims," OECD report, October 1982.

[3]I.C. White, and J.A. Nichols, "The Cost of Oil Spills," proceedings, Oil Spill Conference, San Antonio, March 1983.

suggests that any attempt to link spill claims with spill size is essentially futile, because the range of the ratio of spill damage cost per volume of oil spilled is extremely broad. Moreover, it is usually so difficult to obtain accurate information on spill claims and damage costs that the prospects of performing a viable analysis of this problem are not good.

This chapter provides additional insights on the random nature of oil spill claims, which have not been reported by any previous analysis of oil pollution incidents. These insights have been based on a careful analysis of worldwide oil spill claims data that have been specifically compiled by TBS for this project.

It is generally recognized that attempting to accurately predict future oil spill events is a very difficult task, even on an aggregate level. Predictions of the frequency, location, and volume of oil spills that are likely to occur have never been fully effective. Predicting spill incidents and also the costs associated with cleanup and third-party damages claimed and paid has been demonstrated to be impossible. This is true for two primary reasons:

1. There has been no historical evidence directly linking the size of oil spill claims with other key spill variables for which statistical information exists, such as spill size, vessel size, oil type, or spill geographical location. These relationships have eluded researchers in studying past spills, and any assumptions that these relationships exist in future spills have never been rigorously demonstrated and cannot therefore be rigorously defended.

2. Even for actual spills, comprehensive, consistent information on claims has often not been available or has not been compiled. Many claims are still pending in court, and others mix damage, cleanup, cargo removal, and salvage or wreck removal costs. Furthermore, the distribution of compensation for payments among the liable parties and among the beneficiaries is usually unclear at best.

Therefore, the first step to understanding the nature of oil spills, their characteristics, costs, and payments is the collection of historical spill data for actual claims and the analysis of those data. Toward that goal, a comprehensive oil spill claims database has been developed by TBS. This process is summarized in the next section.

B. THE OIL SPILL CLAIMS DATABASE: SOURCES, COVERAGE, LIMITATIONS

In the past decade, numerous oil spill databases have been developed and are maintained by various organizations in the United States and abroad. For the purposes of this project, TBS compiled its own oil spill claims database because none of the best-known oil spill databases contained any information on tanker spill claims cost and payments.

The database was compiled using tanker spill information furnished mainly by P&I Clubs, combined with additional information from TOVALOP, the IOPC Fund, CRISTAL, and oil industry data. Full cooperation by the P&I Clubs, TOVALOP, and other agencies was provided and is greatly appreciated. The database consists of 146 worldwide tanker and tank barge spills covering the period February 21, 1970, to February 20, 1981, corresponding to 11 policy years of the P&I Clubs. Information on most of those spills was furnished by P&I Clubs; each of these spills cost a minimum of $250,000 (current dollars) for cleanup and third-party liability claims. Information in the database includes the following:

- Spill date
- Vessel name
- Vessel size (GRT and convention tons)
- Spill location and nation(s) affected
- Oil types
- Spill volume (tons)
- Total spill claim/cost (current dollars and 1982 dollars)
- CRISTAL payments
- FUND payments

A comprehensive effort was made to collect, enter, and check the data. Specific requests were made to the P&I Clubs and other agencies to fill the gaps in the database. Because of the potentially sensitive nature of this information and the fact that many of the cases are in the process of being negotiated, arbitrated, and tried in court, the P&I Clubs have requested that the ship-specific information be treated confidentially wherever

possible. While the analysis was conducted on the basis of each incident, the data have been aggregated for publication in order to meet the P&I Club request. Furthermore, some data was provided by TOVALOP on the condition that ship names be suppressed. This request posed no problem in the analysis and presentation of the data and was therefore agreed to.

The database is very accurate but it inevitably has certain limitations. For instance, spill coverage by certain P&I Clubs prior to 1973 is incomplete. More importantly, in cases where claims have not yet been settled, TBS has estimated the likely level of provable damages. These estimates are based on TBS's discussions with the insurers and compensation funds involved.

A second limitation is the inherent difficulty the P&I Clubs have in separating oil pollution costs from other damages in some specific cases. An example of this is the allocation of the cost of cargo pumping from a leaking tanker between oil pollution avoidance and cargo salvage. TBS has reviewed major cases with the P&I Clubs and has relied on their experience and judgment in allocating these costs. In general, the costs of incidents where tank ships damaged facilities or non-tankships and caused pollution, but where the tank ships did not spill oil, are excluded because their liability is not covered by these regimes. Incident cost data have been restricted to oil-spill-related costs wherever possible in order to present the data fairly and consistently. Costs such as wreck removal, crew injury, cargo loss, ship loss, etc., have been deducted on the basis of review of the data by the P&I Clubs, wherever possible and appropriate.

The $250,000 (current dollars) minimum cutoff for inclusion in the database imposes a slight skew in the case of smaller spills. More small spills are included for more recent years: a $250,000 spill in 1970 would have an estimated cost of $650,000 in 1982. The $250,000 amount was selected by the P&I Clubs and provides this study with a large number of incidents for which fairly complete data are available. There is no other spill database, including TOVALOP's 7,000-spill data, which includes thorough cost data. While some skewing of the small-spill population exists, the inclusion of more recent small spills does enhance the representation of small spills in a geographically consistent way. As Smets of OECD points out, claims of less than $250,000 per spill account for less than 25 percent of the value of all claims in the period of interest.[4] The exclusion of these

[4]Smets, Economic Implications of Various Compensation Limits for Oil Pollution Claims, OECD Report, October 1982.

small claims has a minimal impact on the analysis, since they nearly all fall within the tanker owner's liability range and do not affect FUND or CRISTAL.

The 146-spill database includes spill volume data for 110 spills. The remaining 36 spills have only partial information on their volumes: 22 of them are designated as "above 5,000 barrels," whereas no volume information is available for the remaining 14 spills. Obviously, this fact alone introduces some bias in those spill statistics that are related either directly or indirectly to spill volume (for instance, total volume spilled or average claim per ton spilled). However, no bias is introduced in the analysis of the overall number and amount of claims as well as the distribution of liability of claims among the parties involved (see Section D below). In any event, the 36 spills in question account for about $83 million in claims (1982 dollars) out of a total of about $720 million for all 146 spills in the database (or, 11.5 percent of total claims).

The final database is believed to contain the most accurate historical oil spill claims data yet developed and reflects the assistance of the U.S. Coast Guard, P&I Clubs, TOVALOP, the IOPC Fund, and CRISTAL in the effort.

C. PRELIMINARY OBSERVATIONS ON THE DATABASE

Figures VII-1 to VII-15 provide a preliminary indication of the types of analysis which can be conducted with the database. Each figure is a scattergram of several variables of the database (or of a subset of it), taken two at a time.

Figures VII-1 through VII-3 plot claims versus vessel size whereas Figures VII-4 through VII-6 plot claims versus tons spilled. Each set of figures presents the data for total world spills, those in non-U.S. waters, and those in the U.S. An immediate observation from those figures is that the range of all these variables is extremely broad. A second observation is that there seems to be relatively little correlation of claims with either vessel size or spill volume, although various "envelopes" can be constructed. It can also be noted that the U.S. has not suffered from claims as high as those in non-U.S. waters.

Finally, Figures VII-7 through VII-15 refer to the three main types of oil: crude, residual, and bunker, respectively, for the world, non-U.S. countries, and the U.S. There are significant differences in number and magnitude of claims among these categories. Generally, crude oil and residual oil claims appear to be higher than bunker spill claims.

The above observations are, of course, qualitative. The next section discusses the quantitative assessment of the spill database.

D. AGGREGATE SPILL CLAIM STATISTICS

Exhibits VII-1 to VII-6 of this section present aggregate statistics from the 146-spill database described in the previous section. Each of the exhibits breaks down the statistics in a different way:

- Exhibit VII-1: Breakdown by year
- Exhibit VII-2: Breakdown by geographical area
- Exhibit VII-3: Breakdown by oil type
- Exhibit VII-4: Breakdown by claim size
- Exhibit VII-5: Breakdown by vessel size
- Exhibit VII-6: Breakdown by spill volume

These exhibits generally tabulate the following statistics:

- Number of incidents
- Total claims
- Average claim per incident
- Total spill volume
- Average claim per ton spilled

Various other statistics, such as averages and standard deviation, are also presented. All exhibits cover the entire 146-spill database. Spill-volume-related statistics are calculated only for those 110 spills for which volume information is available. As a result, the values of the total spill volume that are displayed in the exhibits are lower bounds of the actual (unknown) total spill volumes. The opposite is true for the values of the claims per ton spilled.

The rest of this section summarizes the main observations that can be drawn from the statistics displayed in Exhibits VII-1 to VII-6.

Exhibit VII-1: Breakdown by Year

There has been considerable variation in the number of incidents per year as well as the total claims per year during the 1970-1980 period. The variation of the total claims is more significant than the variation of the number of incidents each year, the latter being approximately at the same level from 1974 to 1980 (16 to 22 per policy year).

The range of claim sizes is extremely broad. Notice that the standard deviation of claim (a measure of how much that variable deviates from its mean) is more than three times as high as its average value.

Exhibit VII-2: Breakdown by Geographical Area

Although the United States has suffered the largest number of spills for any given country (about 27 percent of the total), France exhibits the highest level of claims (about 38 percent of total claims). France is also the leader in terms of average claim per incident (about seven times the world average, whereas that of the United States is at about 60 percent of the world average). France leads in average claim per incident because the two biggest spills (in terms of claims) occurred in French waters (the AMOCO CADIZ and the TANIO spills). The Scandinavian region is the leader in terms of average claim per ton spilled (slightly one order of magnitude above the world average). Overall, important differences exist among countries.

Exhibit VII-3: Breakdown by Oil Type

Crude oil is the dominant variable in the following categories: number of incidents (47 percent of the total), total claims (68 percent of the total), total spill volume (86 percent of the total) and average claim per incident (about 46 percent above the overall average). However, residual and No. 4 distillate oil exhibit a higher average claim per ton spilled. There has been only one incident involving No. 4 distillate, which means that this statistic may be due to chance alone. However, the difference between $2,540 per ton for residual oil claims and $510 per ton for crude oil claims is significant. Bunker oil accounts for about 11 percent of all spill incidents, but for only 3 percent of the claims and for 3 percent of the spill volume.

Exhibit VII-4: Breakdown by Claim Size

The exhibit confirms the extremely wide range of claims mentioned earlier. Fifty-one percent of the incidents account for only 6 percent of total claim amounts (those are spills with claims below $1 million each), while the two largest of the 146 spills (in terms of claim amounts) account for about 35 percent of all claims. The most expensive spills (in terms of claim dollars per ton spilled) seem to be in the $0.5 to 1 million size range.

Exhibit VII-5: Breakdown by Vessel Size

Vessel size is also a variable whose range is rather broad (its standard deviation is about two-thirds of its average value). The distribution of the average claim per incident among the various vessel-size classes seems to indicate a slightly upward trend with vessel size. All the above tend to support the hypothesis that vessel size is not a major determinant of claim amounts, although for a given cargo type and spill location, vessel size would certainly play a role.

Exhibit VII-6: Breakdown by Spill Volume

The exhibit confirms the previously discussed wide range of spill volumes. Notice that the standard deviation of the spill volume is almost four times as large as its average value. The distribution of total claims within that broad range of spill volumes appears to be marginally uniform, although the volume classes themselves are of a different size each time. The exhibit shows that smaller spills (in terms of total claim amount) are relatively more expensive in terms of claims per ton spilled.

E. HYPOTHETICAL BREAKDOWN OF LIABILITY AND COMPENSATION IF CLC/FUND CONVENTIONS WERE IN FORCE WORLDWIDE

In this section, the claims breakdown among the parties involved for the hypothetical case in which the CLC/FUND conventions were in force for the entire period is analyzed. This analysis is based upon the 146 spill database with claim values adjusted to 1982 dollars. All nations are assumed to ratify the CLC and FUND conventions, so that the analysis is consistent worldwide. Current limits of liability are the basis for the

allocation of liability between CLC (shipowner liability); FUND (receiving terminal liability) and uncompensated liability (liability for claims in excess of $49.6 million).

Aggregate statistics on the numbers, dollar amounts, and percentages of claims that fall within the above three categories are presented in Exhibits VII-7 to VII-12, analyzed in terms of present FUND-member countries, the United States, and all other countries that have not yet ratified. From these exhibits, the following conclusions can be drawn:

- Exhibit VII-7 identifies the distribution of the 146 incidents. FUND member countries would account for 61 incidents, roughly half of which would require FUND compensation. The United States would account for 40 incidents, 14 of which would require FUND compensation and the non-FUND countries would account for 45 spills, 11 of which would require FUND compensation. Two incidents, both in present FUND countries, would have had uncompensated components.

- Exhibit VII-8 summarizes the distribution of cost. A total of $720 million (1982$) would be apportioned between CLC, FUND and uncompensated categories. The United States would have received $68.1 million in FUND compensation, roughly $6.2 million per year.

- Exhibit VII-9 summarizes the distribution of claims between the CLC, FUND and uncompensated categories. The current CLC/FUND compensation provisions would place 50 percent of total world compensation as a FUND liability; 29 percent would be paid by CLC and 21 percent would be uncompensated. This indicates that FUND would be the major source of compensation given the current limits, paying more than twice the CLC liability in the FUND countries, and 1.8 times the CLC liabilities in the non-FUND countries and 1.3 times the CLC liability in the U.S.

- Exhibit VII-10 shows that 45 percent of FUND compensation would be provided to present FUND countries, 19 percent to the U.S. and 36 percent to the current non-FUND countries. The distribution for CLC is similar, but their compensation paid to the United States would be higher and compensation to current FUND members would be lower.

- Exhibit VII-11 summarizes the average size of claims by type of nation and category. The average amount of shipowner (CLC) compensation paid is $2.5 million and is fairly consistent between present FUND countries, the U.S. and other presently non-FUND countries. By contrast the average FUND liability varies widely between the three types of nations, with non-FUND countries having $9.3 million average FUND compensation compared to a world average of $5.8 million and a U.S. average of $3.8 million.

- Exhibit VII-12 summarizes the comparison of compensation for all of the 146 incidents. Present FUND countries account for nearly 55 percent of all compensation (or of total claims). The U.S. accounts for about 17 percent and the other currently non-FUND about 28 percent.

Figure VII-1

CLAIMS VERSUS VESSEL SIZE

$000 - 1982

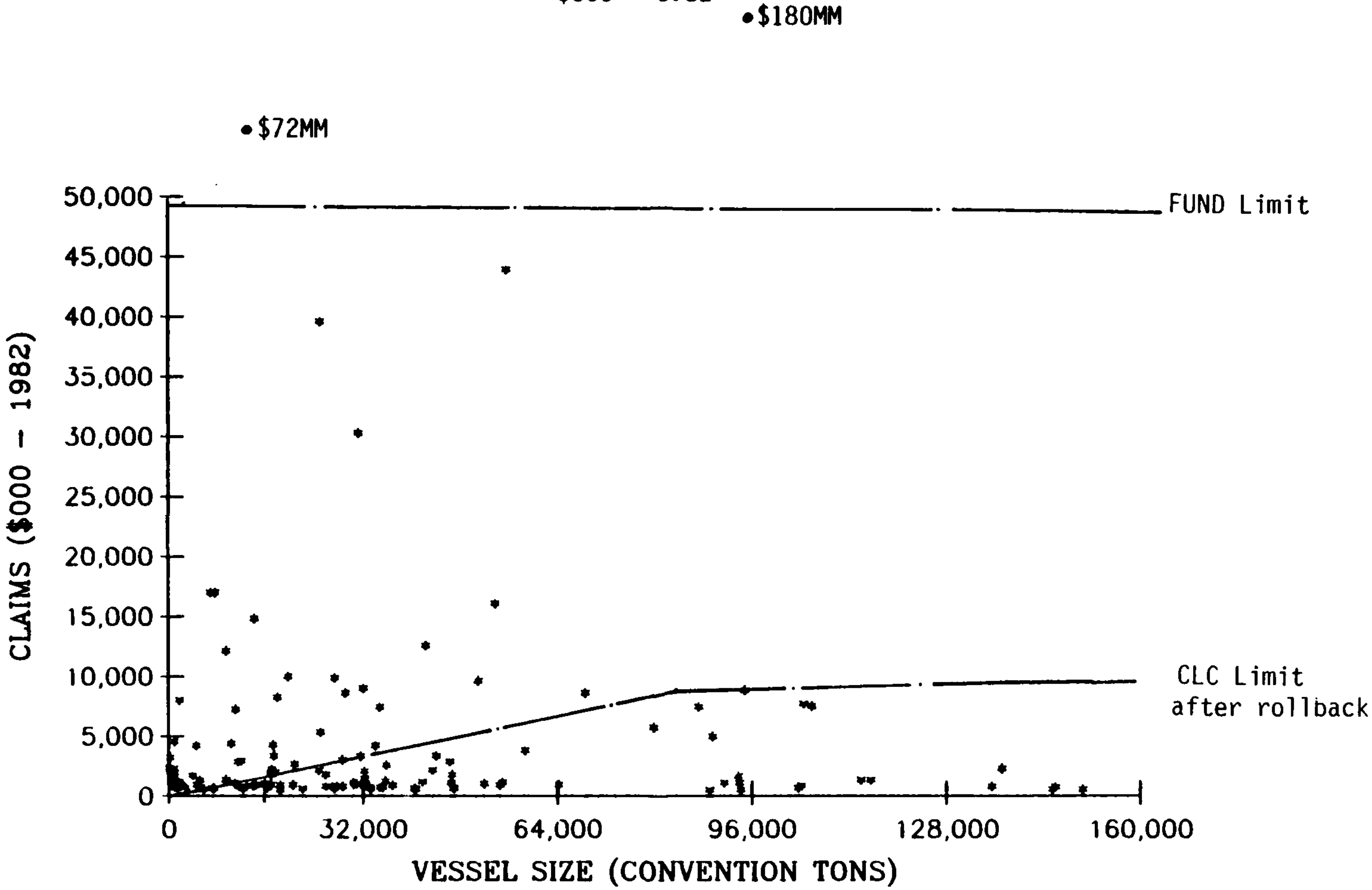


Figure VII-2

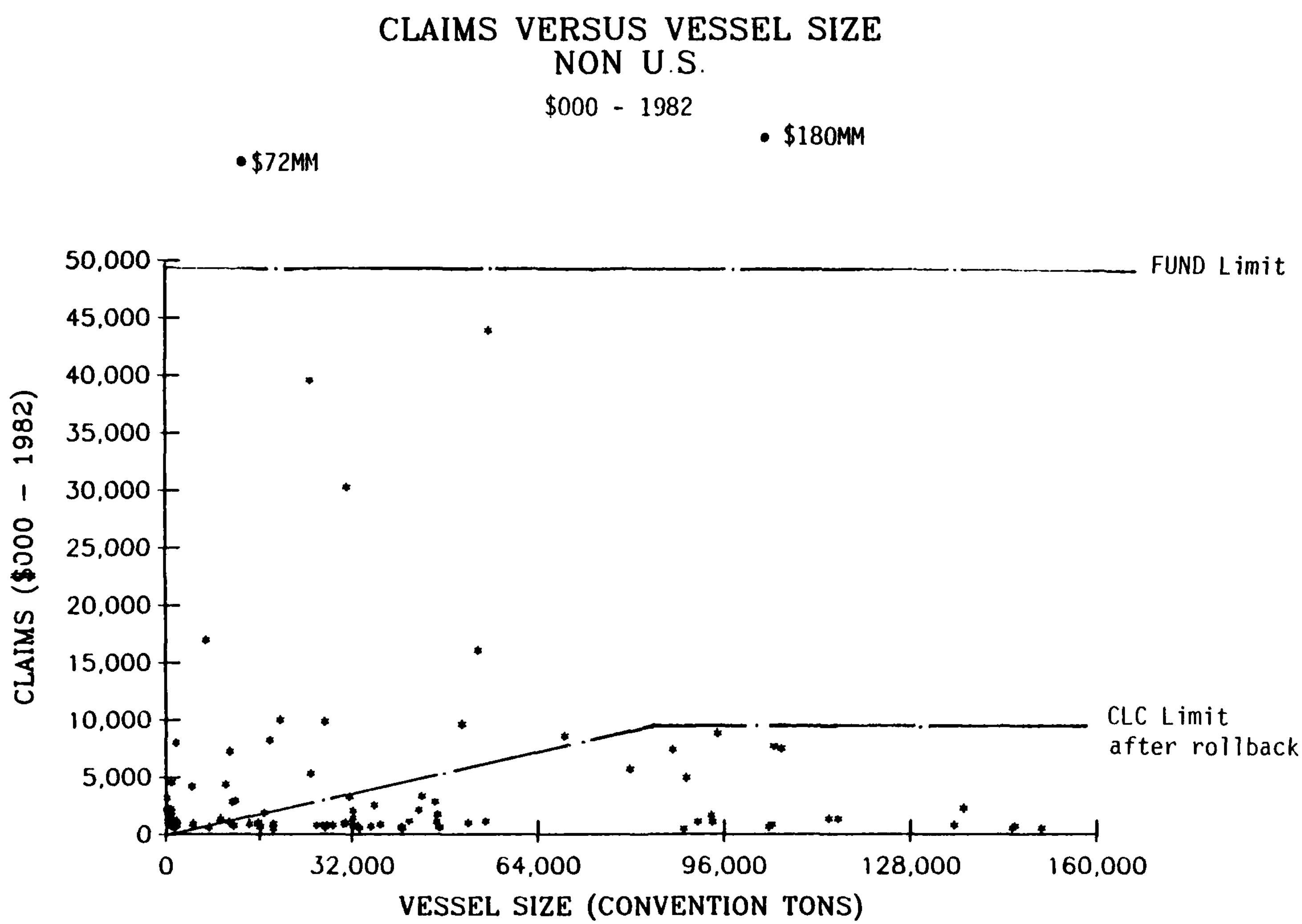

CLAIMS VERSUS VESSEL SIZE
NON U.S.
$000 - 1982
$72MM
$180MM
FUND Limit
CLC Limit
after rollback
CLAIMS ($000 - 1982)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
32,000
64,000
96,000
128,000
160,000
VESSEL SIZE (CONVENTION TONS)

Figure VII-3

CLAIMS VERSUS VESSEL SIZE
U.S.
$000 - 1982

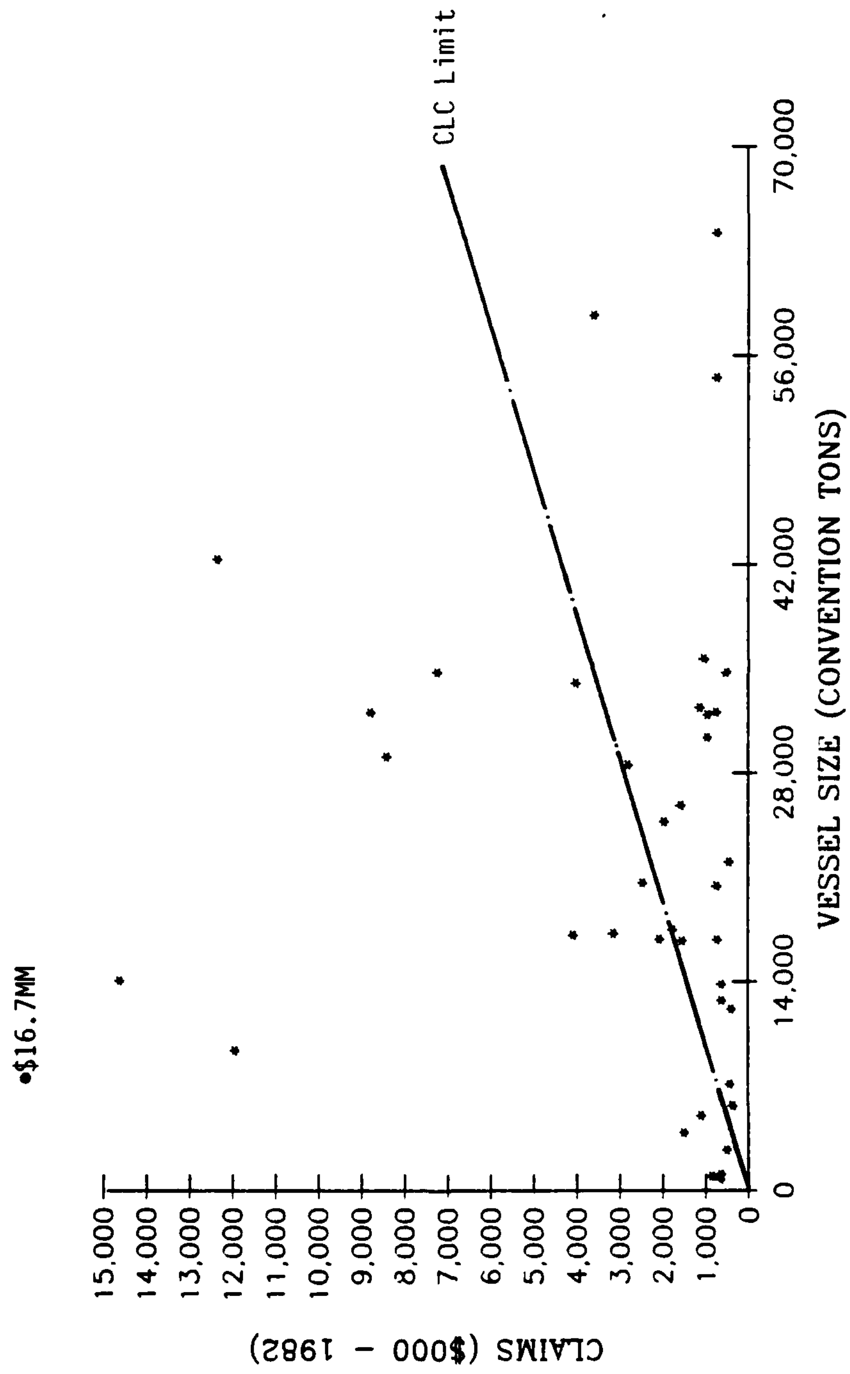


Figure VII-4

CLAIMS VERSUS TONS SPILLED

$000 - 1982

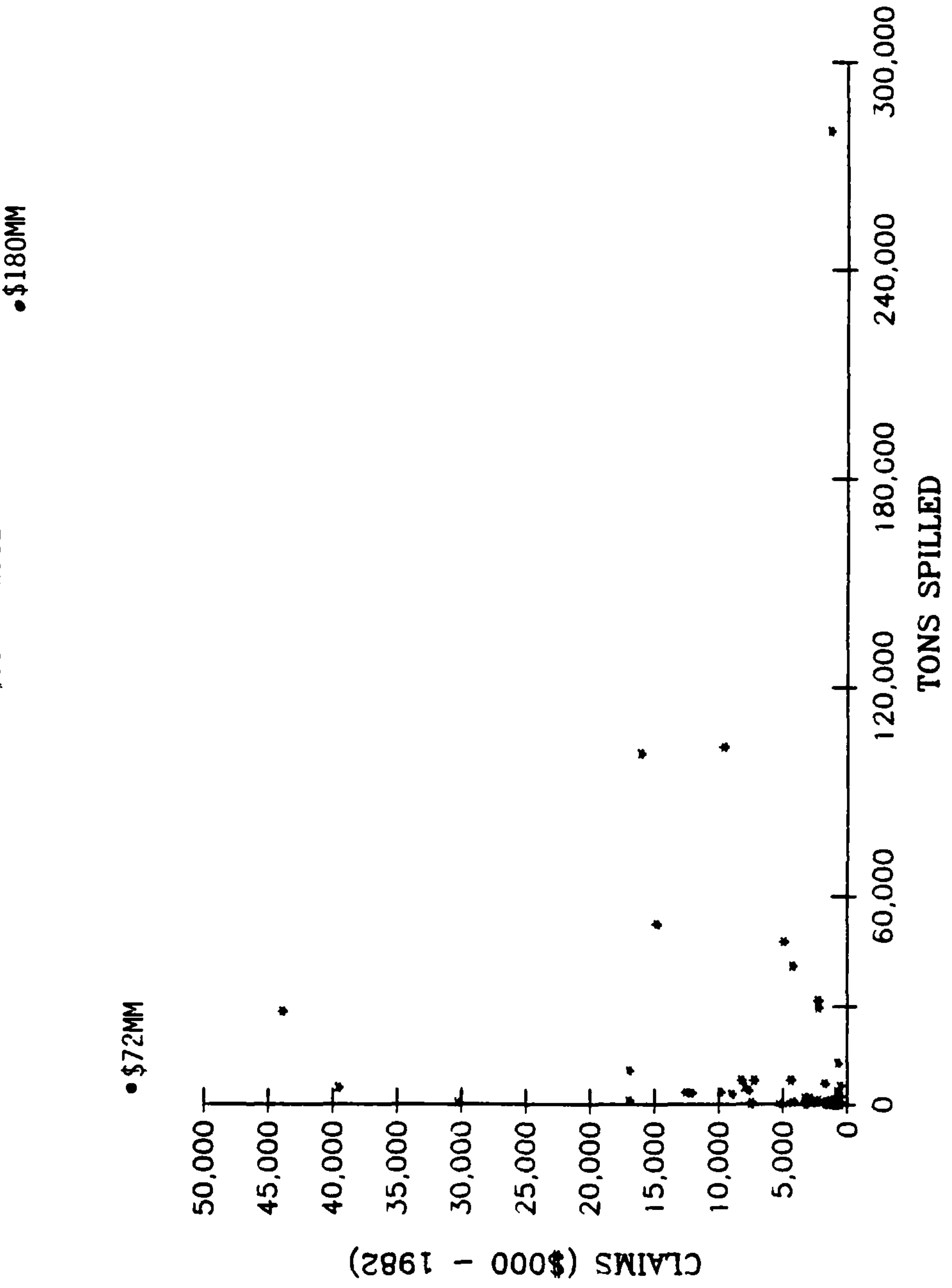


Figure VII-5

CLAIMS VERSUS TONS SPILLED
NON-U.S.
$000 - 1982

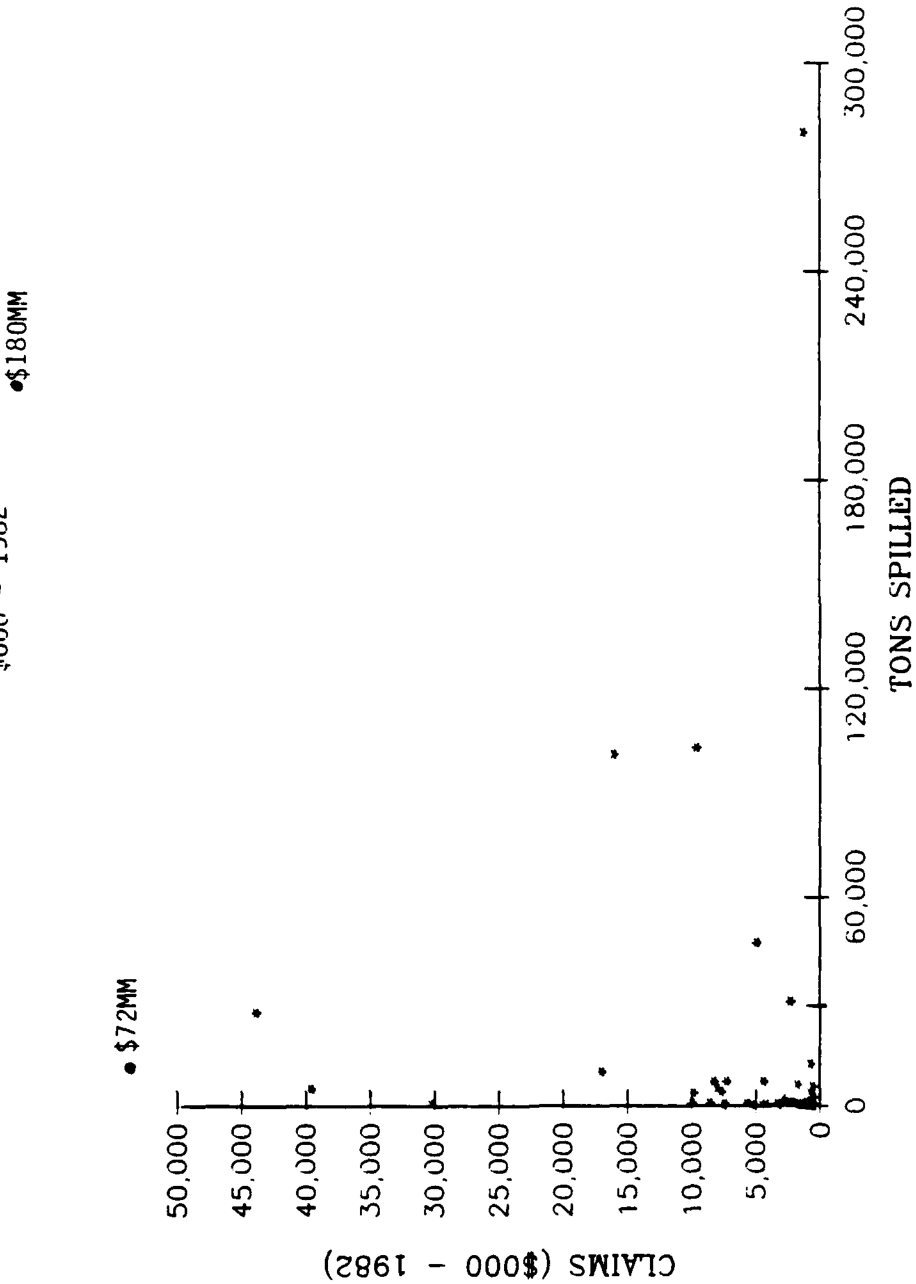


Figure VII-6

CLAIMS VERSUS TONS SPILLED
U.S.
$000 - 1982

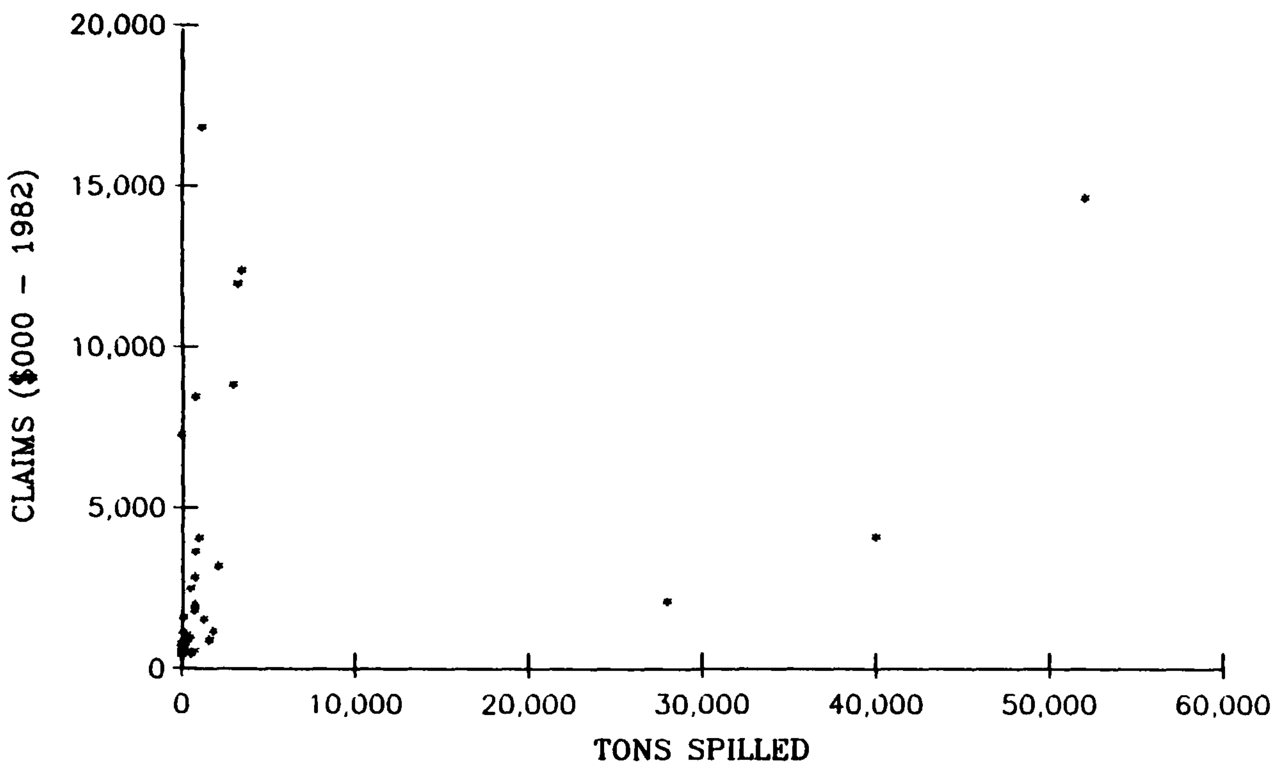


Figure VII-7

CLAIMS VERSUS VESSEL SIZE
CRUDE OIL

$000 - 1982

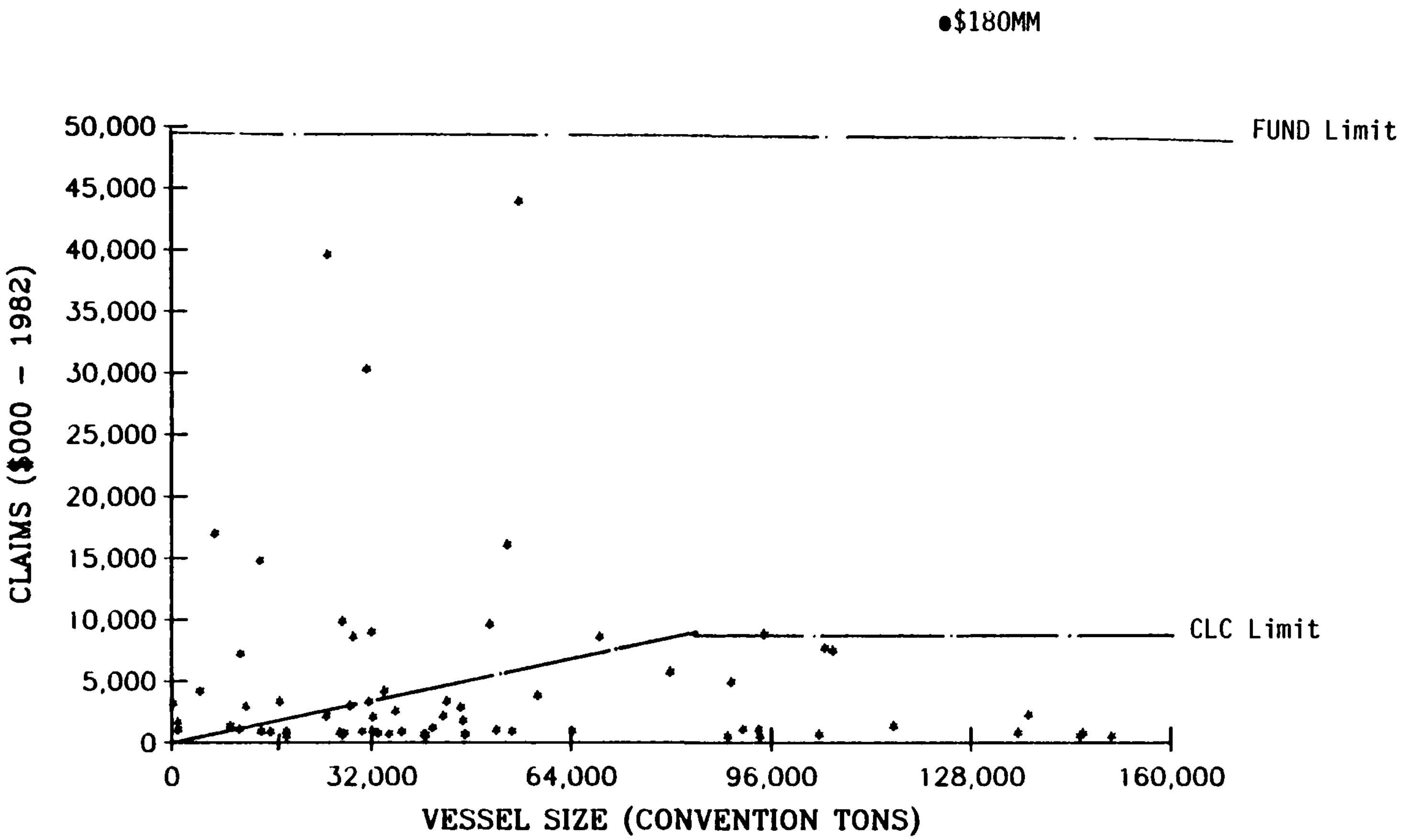


Figure VII-8

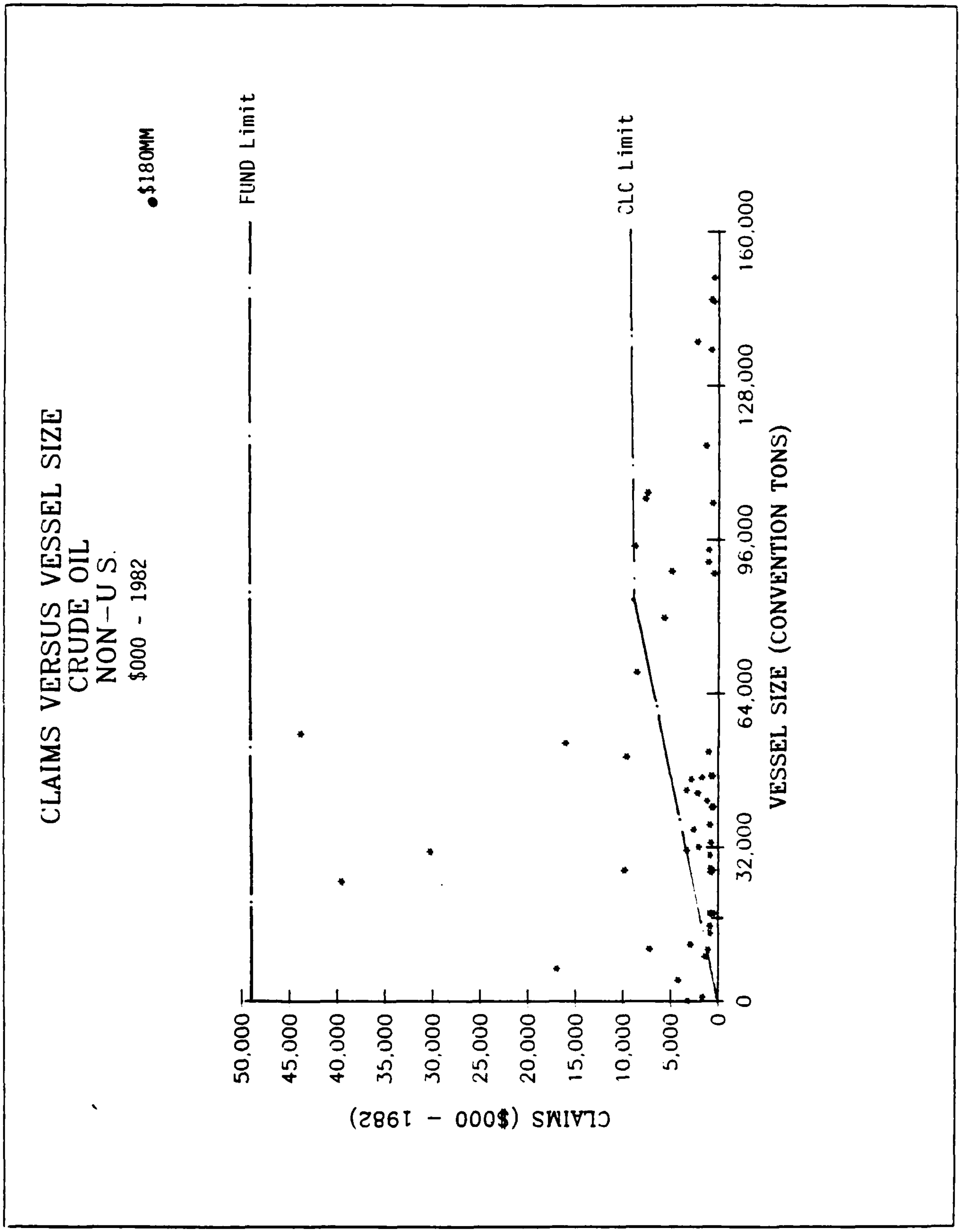

CLAIMS VERSUS VESSEL SIZE
CRUDE OIL
NON-U.S.
$000 - 1982
$180MM
FUND Limit
CLC Limit
CLAIMS ($000 - 1982)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
32,000
64,000
96,000
128,000
160,000
VESSEL SIZE (CONVENTION TONS)

Figure VII-9

CLAIMS VERSUS VESSEL SIZE
CRUDE OIL
U.S.
$000 - 1982

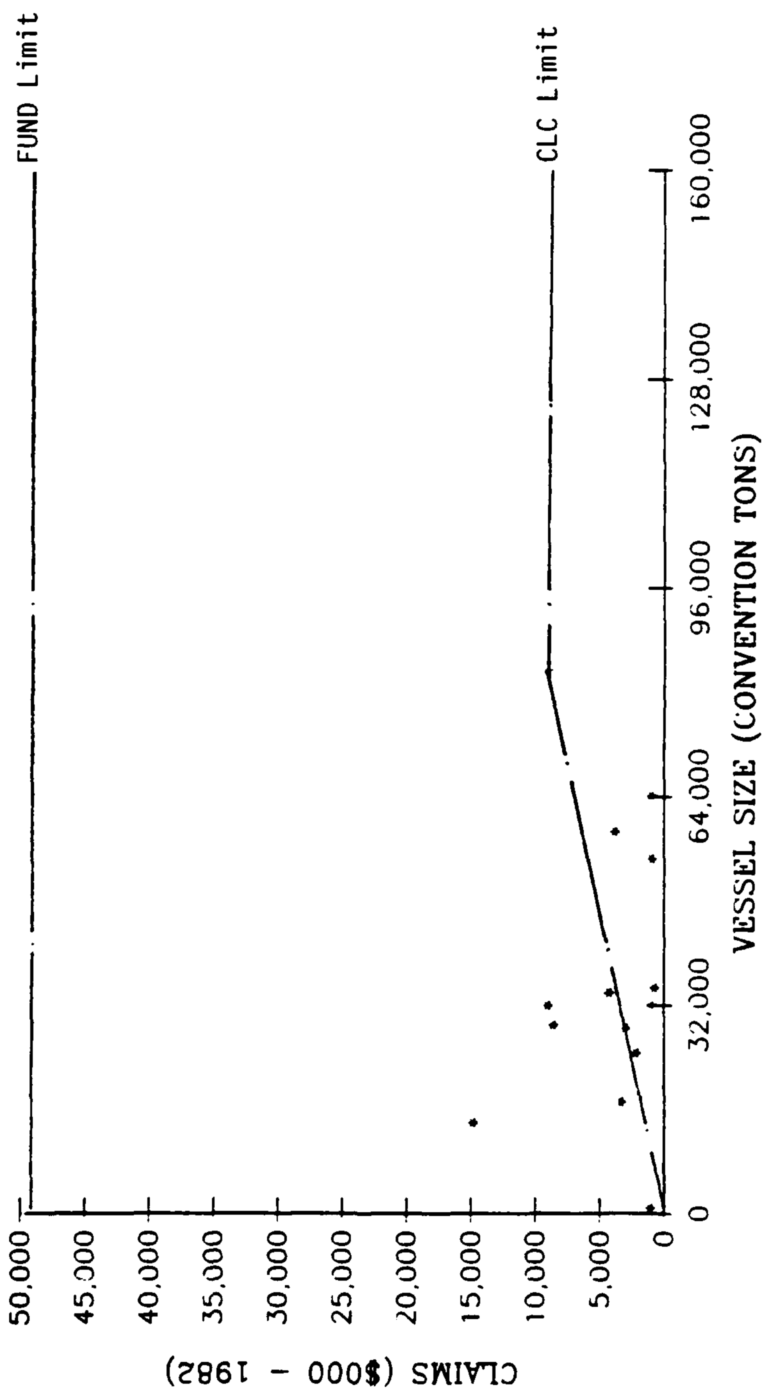


Figure VII-10

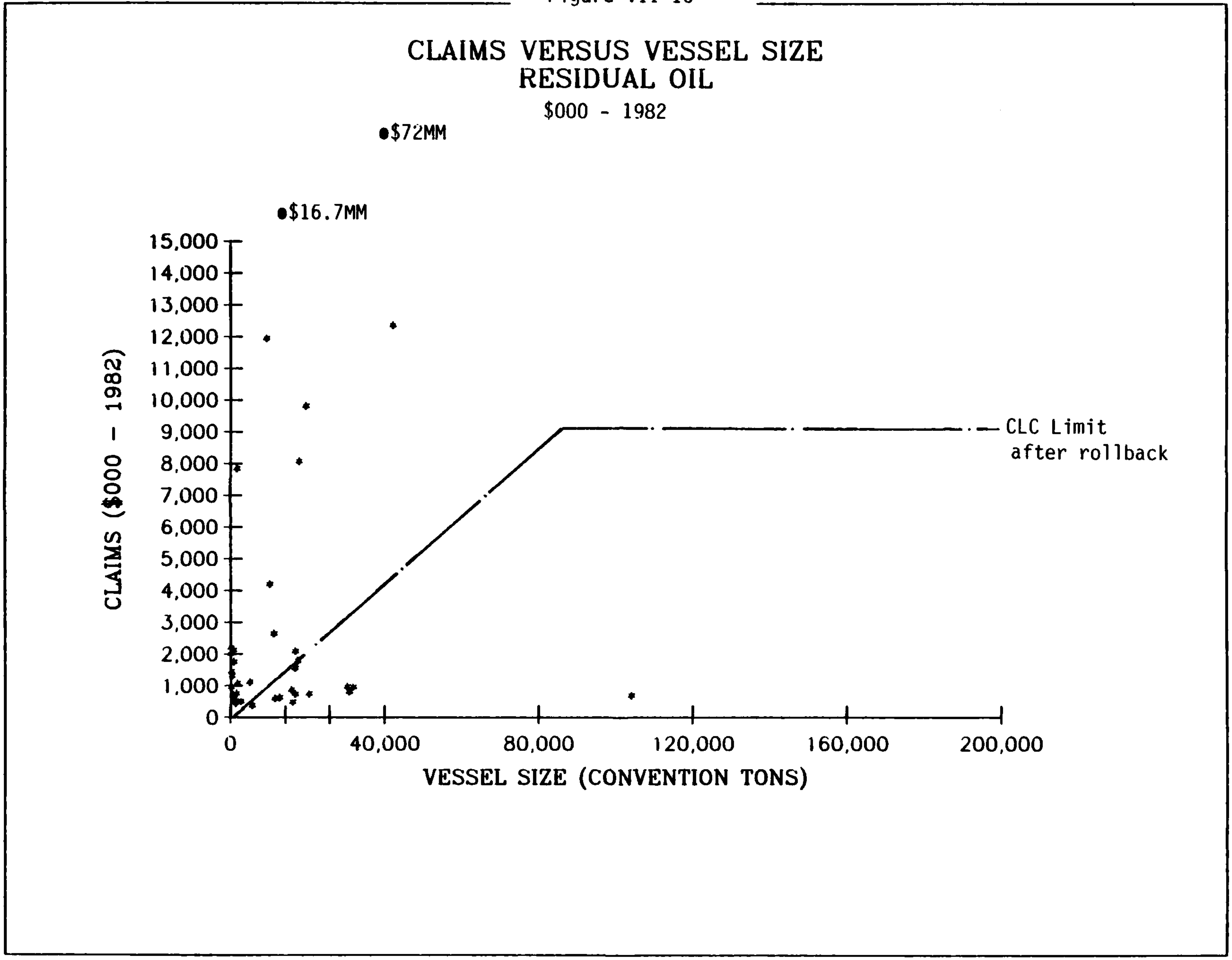


Figure VII-11

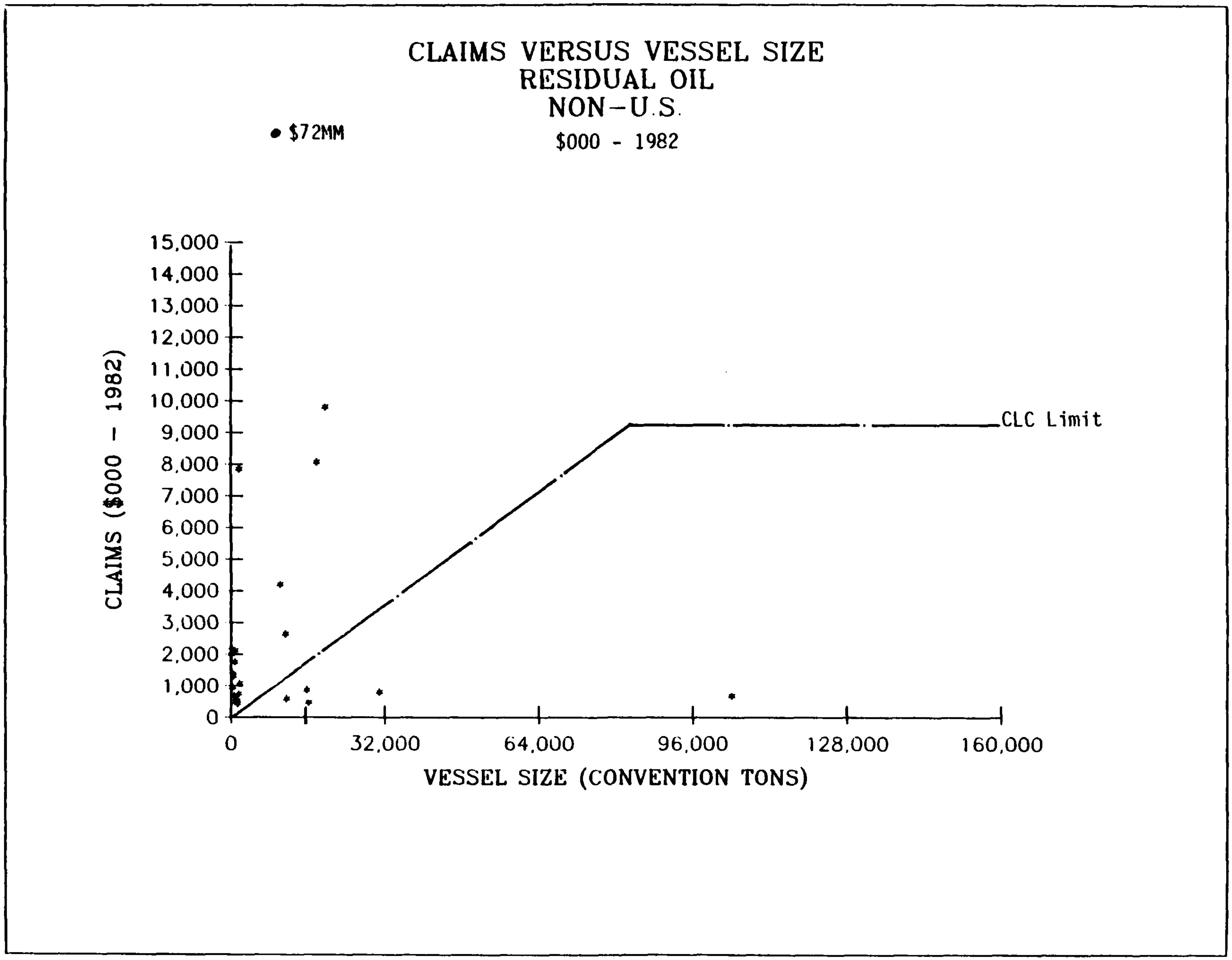


Figure VII-12

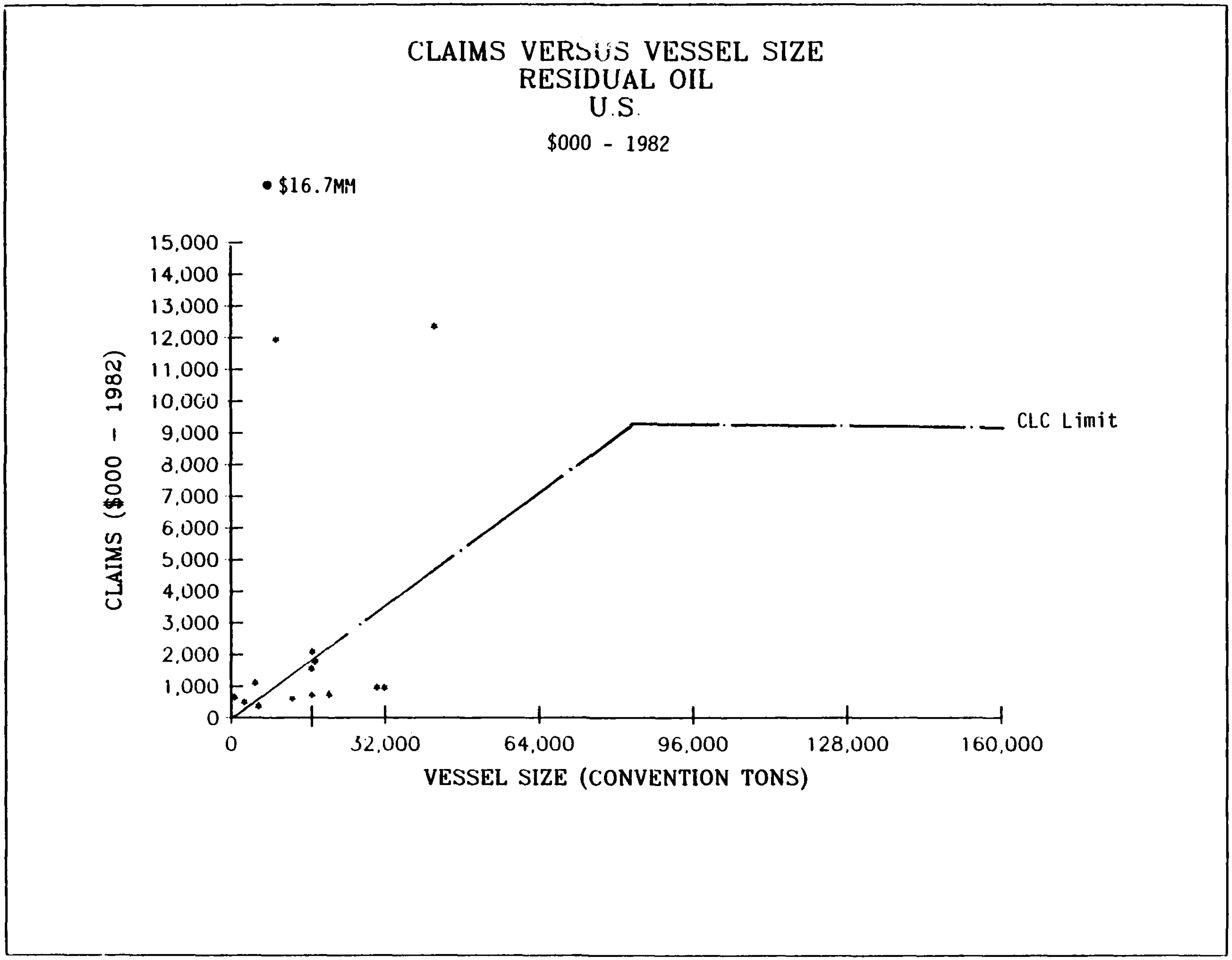


Figure VII-13

CLAIMS VERSUS VESSEL SIZE
BUNKERS
$000 - 1982

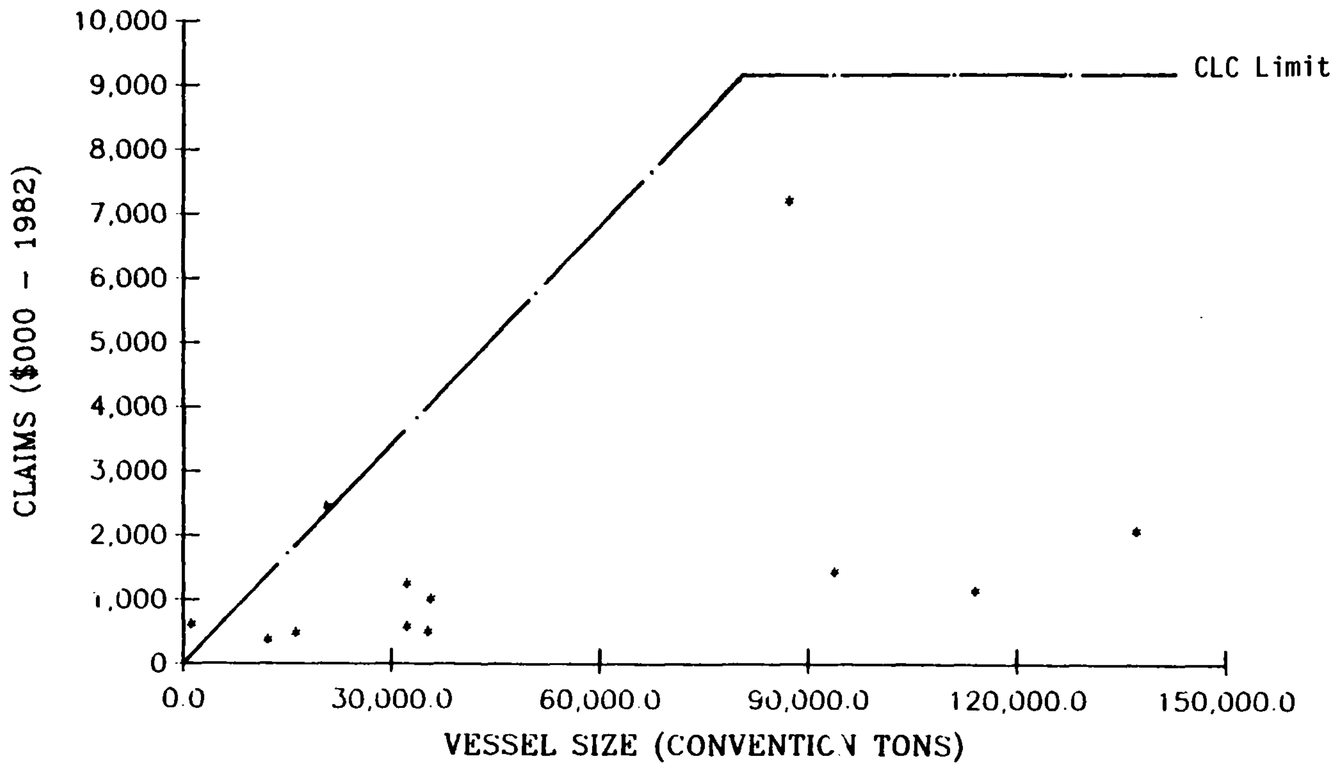


Figure VII-14

CLAIMS VERSUS VESSEL SIZE
BUNKERS
NON-U.S.
$000 - 1982

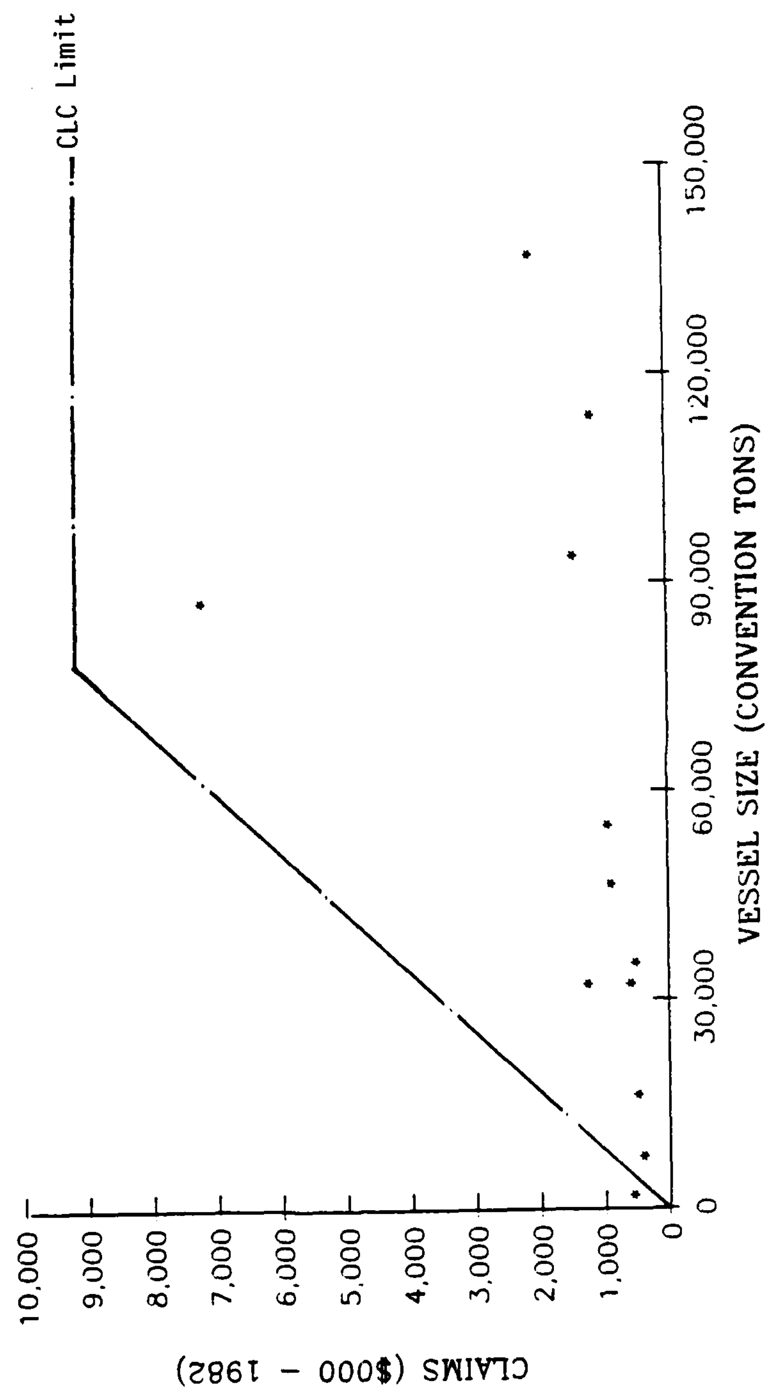


Figure VII-15

CLAIMS VERSUS VESSEL SIZE
BUNKERS
U.S.
$000 - 1982

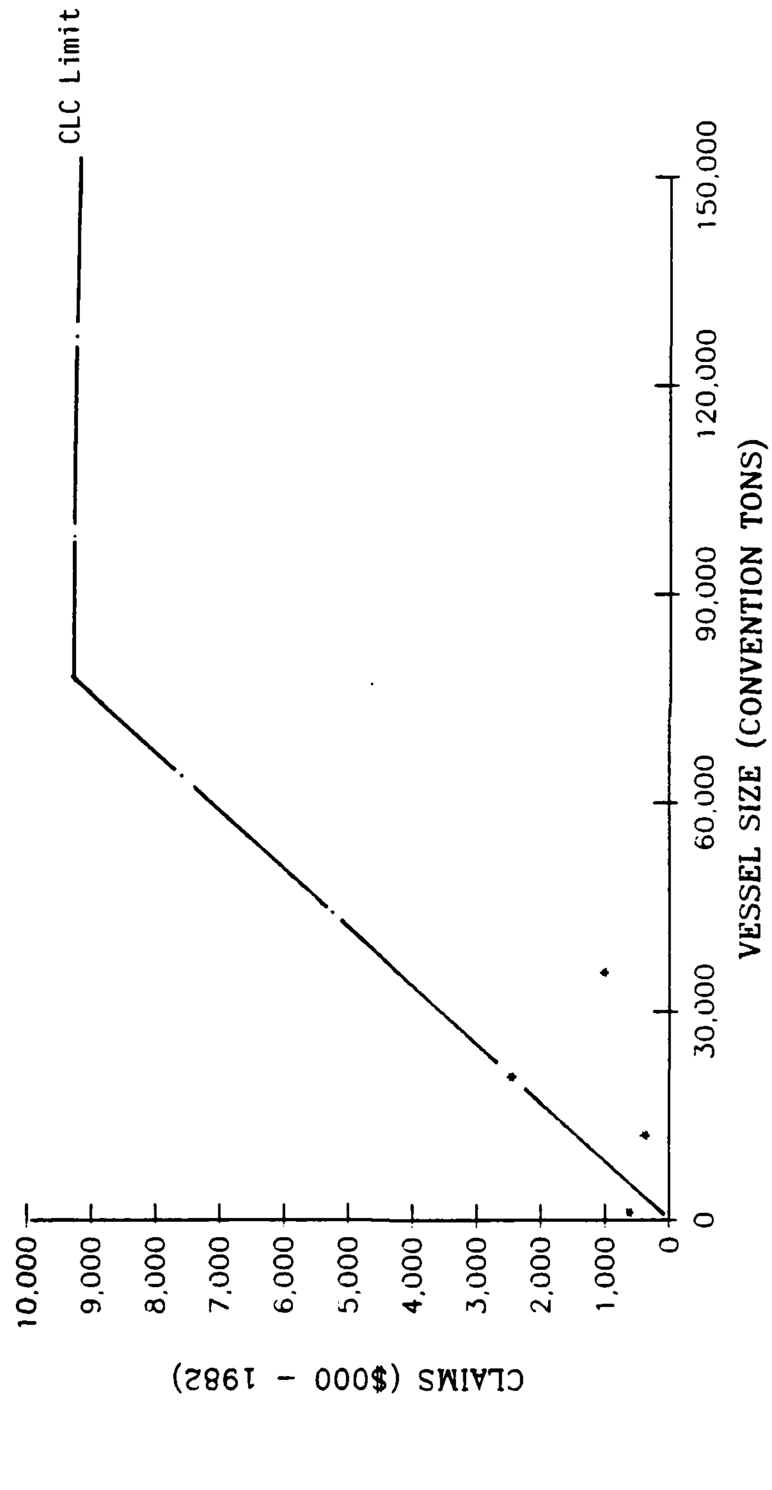


Exhibit VII-1

CLAIMS ANALYSIS BY YEAR,
ACTUAL 1970-1980 EXPERIENCE

(thousands of 1982 dollars)

	Number of Incidents	Total Claims
1970	1	$ 4,121
1971	4	20,167
1972	2	13,949
1973	9	25,249
1974	13	21,489
1975	18	33,674
1976	18	73,351
1977	15	24,917
1978	21	230,685
1979	21	141,385
1980	20	124,166
1981 (2 months)	4	6,412
All Years	146	$719,565
Average Claim per Incident		$4,928
Standard Deviation of Claim		$16,787

Exhibit VII-2

CLAIMS ANALYSIS GEOGRAPHICAL AREA,
ACTUAL 1970-1980 EXPERIENCE

(1982 dollars in thousands)

Geographical Area	Number of Incidents	Total Claims	Average Claim per Incident	Total Spill Volume[1] (tons)	Average Claim per Ton Spilled[1]
United States	40	$122,814	$ 3,000	142,313	$0.86
Japan	26	52,668	2,025	13,765	3.82
United Kingdom	6	27,975	4,662	11,051	2.53
France	8	273,245	34,155	248,137	1.10
Scandinavia	7	12,232	1,747	2,240	5.46
Rest of Europe	20	94,567	4,728	297,982	0.31
Rest of World	39	136,064	3,488	382,924	0.35
All areas	146	$719,565	$ 4,929	1,098,412	$0.66

[1]These figures are based only on those 110 spills for which volume information was available. Therefore figures in the "Total Spill Volume" column are underestimates and figures in the "Average Claim per Ton Spilled" column are overestimates of their actual values, which remain unkown.

Exhibit VII-3

CLAIMS ANALYSIS BY OIL TYPE,
ACTUAL 1970-1980 EXPERIENCE

(1982 dollars in thousands)

Oil Type	Number of Incidents	Total Claims	Average Claim per Incident	Total Spill Volume[1] (tons)	Average Claim per Ton Spilled[1]
Crude	68	$488,156	$7,178	942,807	$ 0.51
Residual	40	174,816	4,370	68,701	2.54
No. 4 Distillate	1	5,050	5,050	275	18.36
Light Distillate	5	4,122	824	1,554	2.65
Other Distillate	3	5,044	1,684	40,090	.12
Bunker	16	21,171	1,323	33,835	0.62
Unknown	13	21,206	1,631	11,150	1.90
All Types	146	$719,565	$4,929	1,098,412	$ 0.66

[1]Based on only 110 spills (see also note on Exhibit VII-2).

Exhibit VII-4

CLAIMS ANALYSIS BY CLAIM SIZE,
ACTUAL 1970-1980 EXPERIENCE

(1982 dollars in thousands)

Claim Size	Number of Incidents	Total Claims	Average Claim per Incident	Total Spill Volume[1] (tons)	Average Claim per Ton Spilled[1]
Below $500	54	$266,620	$492	31,779	$0.83
$500-$1,000	34	34,758	1,022	17,221	2.01
$1,000-$5,000	35	113,959	3,255	490,367	0.23
$5,000-$10,000	15	130,098	8,763	178,295	0.72
$10,000-$50,000	6	162,130	27,021	144,750	1.12
Above $50,000	2	252,000	126,000	236,000	1.06
Overall	146	$719,565	$4,929	1,098,412	$0.66
Average Claim per Incident	4,923				
Standard Deviation	16,787				

[1]Based on only 110 spills (see also note on Exhibit VII-2).

Exhibit VII-5

CLAIMS ANALYSIS BY VESSEL SIZE,
ACTUAL 1970-1980 EXPERIENCE

(1982 dollars in thousands)

Vessel Size (thousands of convention tons)	Number of Incidents	Total Claims	Average Claim per Incident	Total Spill Volume[1] (tons)	Average Claim per Ton Spilled[1]
Below 1	20	$27,969	$1,398	7,497	$3.73
1-5	13	18,878	1,452	8,227	2.29
5-10	8	48,421	6,053	15,503	3.12
10-25	32	189,506	5,922	157,809	1.20
25-50	37	112,403	3,038	32,111	3.50
50-100	18	106,928	5,940	287,654	0.37
Over 100	18	215,460	11,970	589,611	0.36
Overall	146	$719,565	$4,929	1,098,412	$0.66
Average Vessel Size per Incident	34,199 convention tons				
Standard Deviation	19,203 convention tons				

[1]Based on only 110 spills (see note on Exhibit VII-2).

Exhibit VII-6

CLAIMS ANALYSIS BY SPILL VOLUME,
ACTUAL 1970-1980 EXPERIENCE

(1982 dollars in thousands)

Spill Volume (thousands of tons)	Number of Incidents	Total Claims	Average Claim per Incident	Total Spill Volume[1] (tons)	Average Claim per Ton Spilled[1]
Below 1	72	$116,046	$1,613	21,334	$9.32
1-5	17	84,382	4,963	38,728	2.17
5-25	10	157,151	17,715	70,350	2.23
25-100	7	72,913	10,416	254,000	0.23
Above 100	4	206,239	51,559	714,000	0.28
Unknown	36	82,834	2,301	-	-
Overall	146	$719,565	$4,929	1,098,412	$0.66
Average Spill Volume per Incident[1]				9,986 tons	
Standard Deviation[1]				37,297 tons	

[1]Based on only 110 spills (see also note on Exhibit VII-2).

Exhibit VII-7

HYPOTHETICAL BREAKDOWN OF LIABILITY AND COMPENSATION
BY NUMBER OF INCIDENTS
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

Geographical Area	Spills Involving Shipowner Liability	Spills Involving FUND Liability	Spills Involving Uncompensated Damage	Total Spills
FUND-Member Countries[1]	41	18	2	61
Non-FUND-Member Countries[2]				
United States	27	14	0	40
All Others	33	11	0	45
All Areas	101	43	2	146

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

Exhibit VII-8

HYPOTHETICAL BREAKDOWN OF LIABILITY AND COMPENSATION
BY DOLLAR AMOUNT OF CLAIMS
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

(millions of 1982 dollars)

Geographical Area	Total Shipowner Liability	Total FUND Liability	Total Uncompensated Damage	Total Claims
FUND-Member Countries[1]	77.4	163.2	152.8	393.4
Non-FUND-Member Countries[2]				
United States	54.7	68.1	-	122.8
All Others	79.1	129.7	0	203.4
Total	205.8	361.0	152.8	719.6

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

Exhibit VII-9

HYPOTHETICAL DISTRIBUTION OF CLAIM PAYMENTS BETWEEN
CLC, FUND AND UNCOMPENSATED CATEGORIES
AS PERCENTAGE OF TOTAL CLAIMS BY COUNTRY-GROUPS
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

	Shipowner Liability (CLC)	FUND Liability	Uncompensated Liability	Total Claims
FUND-Member Countries[1]	20%	41%	39%	100%
Non-FUND-Member Countries[2]				
United States	44	56	-	100
All Others	36	64	0	100
All Areas	29	50	21	100

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

Exhibit VII-10

HYPOTHETICAL DISTRIBUTION OF CLAIM PAYMENTS FOR
CLC, FUND AND UNCOMPENSATED CATEGORIES
AS PERCENTAGE OF TOTAL CLAIMS BY CATEGORIES
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

	Shipowner Liability (CLC)	FUND Liability	Uncompensated Liability	Total Claims
FUND-Member Countries[1]	37%	45%	100%	55%
Non-FUND-Member Countries[2]				
United States	27	19	0	17
All Others	36	36	0	28
All Areas	100	100	100	100

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

Exhibit VII-11

HYPOTHETICAL BREAKDOWN OF LIABILITY AND COMPENSATION
BY AVERAGE AMOUNT OF CLAIMS
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

(millions of 1982 dollars)

Geographical Area	Average Shipowner Liability	Average FUND Liability	Average Uncompensated Damage	Total Claims
FUND-Member Countries[1]	2.7	5.4	76.4	6.4
Non-FUND-Member Countries[2]				
United States	2.5	3.8	-	3.1
All Others	2.4	9.3	-	4.5
All Areas	2.5	5.8	76.4	4.9

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

Exhibit VII-12

HYPOTHETICAL BREAKDOWN OF LIABILITY AND COMPENSATION
AS PERCENTAGES OF TOTAL CLAIMS
BASED ON 1970-1980 EXPERIENCE
ASSUMING ALL NATIONS RATIFY CLC/FUND

Geographical Area	Total Shipowner Liability	Total FUND Liability	Uncompensated Damage	Total Claims
FUND-Member Countries[1]	10.8%	22.7%	21.2%	54.7%
Non-FUND-Member Countries[2]				
United States	7.6	9.5	-	17.1
All Others	10.2	18.0	-	28.3
All Areas	28.6%	50.2%	21.2%	100.0%

[1]Refers to countries presently members of FUND.
[2]Refers to countries not presently members of FUND.

APPENDICES

Appendix A

EXCLUSIVITY AND PREEMPTION

Appendix A

EXCLUSIVITY AND PREEMPTION

The existence of the many different remedies for recovery of cleanup costs and compensation for damages set out in Exhibit I-6 raises several questions. Do they present a menu from which a claimant can choose if his claims fall into more than one of the recovery schemes? Can a claimant pursue more than one remedy at a time, stacking one on top of the other so that if the limits of liability in one scheme are reached, the next can take over and provide added recovery to the claimant? The answers to these questions vary depending on the statute or recovery theory in question. And, as between Federal and State recovery schemes, they are further complicated by the issue of whether the Federal law is meant to preempt state oil pollution liability and compensation schemes.

The FWPCA as the Government's Exclusive Recovery of Cleanup Costs

A most controversial issue has been whether Congress intended that the FWPCA is to provide the Federal government's only means of recouping its costs in spills in which it carries out cleanup operations. It will be recalled that under the FWPCA while the discharger is responsible for cleanup, Coast Guard or other appropriate agencies may carry out the cleanup if the discharger refuses or denies liability or is unknown.

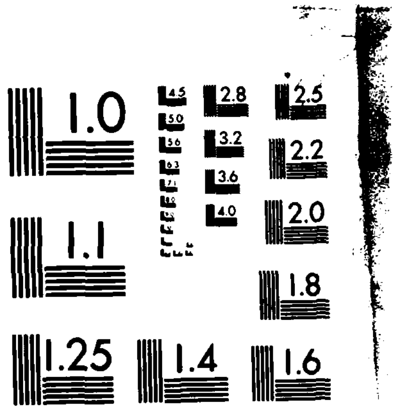
In several cases since the early seventies the Federal government sought recovery under theories of nuisance, maritime tort, and the Refuse Act (Rivers and Harbors Act of 1899, Section 13) in addition to the FWPCA, arguing that Congress did not intend the last to be the exclusive remedy for recovery of cleanup costs. The defendants' counter arguments generally focused on the Act's representing a finely balanced political compromise in which spiller's liability was made strict but limited in amount, unless the discharge resulted from willful negligent or willful misconduct of the discharger. Six relevant cases are:

- In re Steuart Transp. Co., 435 F. Supp. 798 (E.D. Va. 1977), aff'd., 596 F.2d 609 (4th Cir. 1979);

- United States v. Tug J. P. McAllister, Civ. No. 76-462 (D. P.R. Apr. 3, 1980);

AD-A133 111 COST-BENEFIT ANALYSIS OF POSSIBLE US ADHERENCE TO TWO INTERNATIONAL CONVE..(U) TEMPLE BARKER AND SLOANE INC LEXINGTON MA 30 JUN 83 USCG-WER-83-1 DTCG23-82-C-5984 4/4

UNCLASSIFIED F/G 6/6 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

- In re Oswego Barge Corp., 1979 A.M.C. 333 (N.D. N.Y. 1978); affirmed in part, reversed in part, 644 F.2d 327 (2d Cir. 1981);
- United States v. Dixie Carriers, Inc., 462 F. Supp. 1126 (E.D. La. 1978);
- United States v. M/V Big Sam, 454 F. Supp. 1144 (E.D. La. 1978), vacated, 480 F. Supp. 290 (E.D. La. 1979);
- Valley Towing Serv., Inc., v. S.S. American Wheat, Civ. No. 75-363 (E.D. La. Dec. 19, 1978).

The statute itself is vague. It says that the discharger of oil "in violation of subsection (b)(3) of this section shall, no-notwithstanding any other provision of law, be liable to the United States Government for the actual costs" of removal--up to the specified limits.

At the appellate level in the Oswego case, Judge Newman observed that the Supreme Court had created a presumption of preemption of judge-made law by Congressional acts when these were silent on the question of preemption. This applied in cases of maritime nuisance and maritime tort and the judge-made remedy implied in the Refuse Act, even though the judicial role of judge-made law in maritime issues was historically taken to be stronger than in common law issues. Thus he dismissed the government's claims under nuisance maritime tort and the Refuse Act, finding that the FWPCA constituted the federal government's exclusive remedy for recovery of cleanup costs.

The outcome in the other cases at the appellate level has been similar. The three federal courts of appeal reviewing the above cases are now substantially in accord that the FWPCA does provide the exclusive route for the federal government's recovery of cleanup costs from a discharger. The Fifth Circuit, however, has said that in the case of the costs of removal caused by the negligence of third parties, its analysis leads it to find that Congress did not legislate an exclusive remedy, and so in this kind of case, in this circuit, the government can pursue a cause of action based on maritime tort as well as its FWPCA statutory remedy.

However, these cases also remind the reader that the government can pursue remedies other than the FWPCA when it comes to damages other than cleanup costs. The act makes no provision for recovery of damages such as to property or economic loss except that "costs of removal" may include costs to federal or state governments for natural resource restoration and replacement (33 U.S.C. 1321(f)(4)). Thus the government and any other sufferers of damages have to look elsewhere. Judicial opinion, incidentally, has confirmed that the ability of parties other than the government to sue the discharger for damages and for cleanup costs has not been taken away by the statute.

Consideration must also be given the position of state governments trying to recoup their cleanup costs under the FWPCA. Does the judicially construed exclusiveness of the FWPCA also apply derivatively to state governments in such cases when the state cleans up? It would appear so. (The state government's position under its own state statute is a different question and is considered below.)

Finally, an interesting question is raised by the provision of subsection 311(f)(4) that replacement and restoration may be counted as cleanup costs: to the extent such costs really represent damages to the natural resources, has a significant form of other damages been shoveled under the strict liability provisions--and its limits--of the exclusive FWPCA and so be prevented from being recovered under other theories?

The Position of State Compensation and Liability Legislation

A very different question is whether the FWPCA preempts the various state laws described earlier. Here constitutional and political overtones of federalism are important. An understanding of the problems presented by state laws dealing with oil pollution compensation and liability requires a review of the constitutional positioning of admiralty or maritime law. The Constitution provides that the judicial power of the United States extends to "all cases of admiralty and maritime jurisdiction." This is meant that the Federal courts shall have original, that is trial, jurisdiction over all admiralty and maritime cases. Further, "the United States Supreme Court has interpreted the admiralty clause to incorporate by reference the corpus of general maritime law into the law of the United States and to empower its courts to try cases governed by maritime common law principles. [And] the court has held that the admiralty clause authorizes Congress to legislate in maritime and admiralty matters and, moreover, that it 'took from the states all powers, by legislation or judicial decision, to contravene the essential

purposes of, or to work material injury to the characteristic features of such [general maritime] law' . . ." Note, Liability for Maritime Oil Pollution: A Comparison of the Maine Coastal Conveyance Act and Federal Liability Provisions, 29 Maine L. Rev. 47 (1977).

As noted earlier, however, these provisions have not inhibited coastal states from passing a broad range of legislation dealing with oil pollution. In the leading case of Askew v. American Waterways Oper., Inc., 411 U.S. 325 (1973), the Court let a Florida Act stand, finding its terms did not directly conflict with the FWPCA. The statutory provision in question was Section 11(o)(2) of the Water Quality Improvement Act (substantially incorporated into the FWPCA Amendments Act): "Nothing in this section shall be construed as preempting any state or political subdivision thereof from imposing any requirement or liability with respect to the discharge of oil to any waters within such state."

The three activity-specific statutes used a different phraseology, referring to "additional" requirements and speak to the other issues of preemption.

1. The Trans-Alaska Pipeline Authorization Act, in 1973, provided:

   "This subsection shall not be interpreted to preempt the field of strict liability or to preclude any State from imposing additional requirements." (Section (c)(9))

   and

   "If total claims allowed exceed $100 million, they shall be reduced proportionally. The unpaid portion of any claim may be asserted and adjudicated under other applicable federal or state law." (Section (c)(3))

2. As to DWPA, section 18(k), 33 U.S.C. 1517(k), explicitly says the act is not to "be interpreted to preempt the field of liability or to preclude any State from imposing additional requirements or liability . . ."

   <u>But</u> double recovery is explicitly excluded:

   "(2) Any person who receives compensation for damages pursuant to this section shall be precluded from recovery compensation for the same damages pursuant to any other State or Federal law. Any person who receives compensation for damages pursuant to any other federal or state law shall be precluded from receiving compensation for the same damages as provided in this section."

Still another section provides that:

". . . Nothing in this chapter shall be construed to relieve, exempt, or immunize any person from any other requirement imposed by Federal law, regulation, or treaty. (33 U.S.C. 1518(a)(1))

3. And finally, section 310 of the OCSLAA, 43 U.S.C. 1820, provides:

"(a) Compensation for damages or removal costs. Any person who receives compensation for damages or removal costs pursuant to this title shall be precluded from recovering compensation for the same damages or removal costs pursuant to any other State or Federal law. Any person who receives compensation for damages or removal costs pursuant to any other State or Federal law shall be precluded from receiving compensation for the same damages or removal costs under this title.

. . .

"(c) Concurrent liability. Except as otherwise provided in this title, this title shall not be interpreted to preempt the field of liability or to preclude any state from imposing additional requirements or liability for any discharge of oil resulting in damages or removal costs within the jurisdiction of such state."

Thus, in each of the instances in which it has had the opportunity since the FWPCA, Congress appears to have said that far from being preempted states may pass liability schemes which impose added exposure for discharges. And, on their surface, these acts say that the remedies of maritime tort and nuisance would also be available to those claiming under these acts, an outcome different from the judicial constructions of the FWPCA.

Appendix B

APPLICATION OF THE LIMITATION OF LIABILITY ACT

Appendix B

APPLICATION OF THE LIMITATION OF LIABILITY ACT

In 1851 Congress passed the Federal Limitation of Liability Act (46 U.S.C. 181) intended to place the U.S. merchant sailing fleet on a competitive par with that of England. The core of the act for purposes of this analysis is that in case of a casualty, a shipowner's liability is limited to the "value of the vessel after the incident and its freight then pending." Such a limitation can act to deny substantial recovery of cleanup costs and damages to claimants in conditions of the act's applicability. In practice, courts have denied limitation under the Act in approximately two-thirds of the cases decided over the 1953-1981 period.[1]

In briefest summary, the act appears not applicable to the FWPCA and the government's cleanup costs, the other federal statutes and probably including their damages provisions.

It is most clearly applicable to the maritime tort and nuisance theories and any common law recoveries. Its status vis-a-vis the various state statutes is questionable; it probably applies. It most probably is not applicable to the CLC/Fund regime. This appendix examines these conclusions further.

Maritime and Federal Common Law

This body of law is that which the Congress in 1851 most certainly had in mind when it enacted the Limitation of Liability Act. What has changed is the circumstances: the advent of oil pollution in large scale with cleanup and damage costs possible beyond the value of the tanker (especially if it is at the bottom of the sea) and the related evolution of oil pollution as a maritime tort and nuisance within this body of maritime law. Though the application of the Limitation of Liability Act to maritime tort and nuisance oil pollution cases has been strongly criticized, there is no practical doubt that today the statute does apply and so acts as a limitation on recovery of cleanup costs and damages sought under these theories of recovery. Note: Oil

[1]D. Greenman, "Statistical Analysis of Limitation of Liability Cases: October 1953-December 1981," Maritime Law Association of the United States, Document No. 640, June 15, 1982.

Spills and Cleanup Bills, 93 Harv. L. Rev. 1761 (1980), Higgins, Pollution: International Conventions, Federal and State, Pollution: International Conventions, Federal and State Legislation, 53 Tulane Law Review 1328.

The argument suggested by the trial court in Dixie Carriers (462 F. Supp. 1126, 1130, 1344) that the passage of the FWPCA with its own limitations for the dischargers' liability for cleanup costs somehow had acted to supersede the Limitation of Liablity Act with regard to all oil spill pollution damage theories has not been accepted.

The application of the Limitation of Liability Act in maritime tort and nuisance recoveries might not be as ponderous as thought at first consideration. The limitations still might not impede recovery in several instances, for example, when the tanker discharges a large cargo without suffering much damage or when one vessel causes another to spill oil, the causing vessel remaining intact, or when the sheer value of a discharging vessel is sufficient to provide enough limitation fund.

Federal Statutes before 1970

The question of whether the Limitation of Liability Act acts to limit the implied remedy for pollution cleanup costs arguably lodged in the Refuse Act has apparently not been directly faced by the federal appellate courts. This void may be related to the lack of success the government has had in pursuing this theory of recovery, as an alternative to the FWPCA. However, the trial court in Oswego dismissed without prejudice the U.S. Government's claim for civil penalties under the Refuse Act, noting that both parties were in agreement that the Limitation of Liability Act should not apply. (Oswego Barge Lim. Proc., 1979 AMC 333, 334, noted with apparent approval on review Matter of Oswego Barge Corp., 664 F. 2d 327, n.3 at 331.)

There are appellate cases construing the relationship of another section of the 1899 Rivers and Harbors Act, the so-called Wreck Removal Act (33 U.S.C. 409). In 1975, the 7th Circuit held that the Limitation of Liability Act does not apply when strict liability is imposed by that Act with respect to damage to wharves and piers that are located on navigable waterways. (United States v. Ohio Valley Co., 510 F.2d 1184, 1186-87.) Two years later, the 6th Circuit came to a similar conclusion (Hines, Inc. v. United States, 551 F.2d 717). These opinions have led one writer to observe: "[T]he Limitations Act has been held inapplicable to all claims by the government both for recovery of wreck removal costs and for damage to government-erected structures. (Rae M. Crowe, "Kinds of Losses Subject to Limitation:

The Personal Contract Doctrine," 53 Tulane Law Review, 1087, 1126, citing the above cases, and University of Texas Medical Branch at Galveston v. U.S., 557 F.2d 438 (5th Cir. 1977), cert. denied 99 S.Ct. 84 (1978).

One appellate court, the 2nd Circuit in Oswego has based a comment on the inconsistency in forms of recovery as between the Refuse Act and the FWPCA on the apparent assumption that the Wreck Removal Act-derived doctrine that the Limitation of Liability Act would not apply is also applicable to the Refuse Act:

> " . . .such [Refuse Act] remedies would be plainly inconsistent with the FWPCA, because the strict liability remedy of the FWPCA is subject to dollar limitations, while recovery of damages under the River and Harbors Act of 1899, when permitted at all, is not subject to the limits of the Limitation Act, University of Texas Medical Branch v. United States, 557 F.2d 438 (5th Cir. 1977). . ."

This kind of indirect comment would appear to be uncertain ground on which to base exemption from the Limitation of Liability Act, especially since in Oswego, the case in point, Judge Newman held that the FWPCA made the Refuse Act redundant, at least as far as the government's right to recovery of cleanup costs was concerned. In any case, since the courts are clear that the Refuse Act does not provide an alternative recovery to FWPCA for the government's recoupment of recovery costs, the point is somewhat moot (see Appendix A).

Federal Statutes Since 1970

The Limitation of Liability Act has been held not to apply to the FWPCA and apparently do not apply to the three subsidiary statutes.

The Limitation of Liability Act and the FWCPA

Section 311(f) of the FWPCA sets out the liability of owners and operators of vessels for removal costs "notwithstanding any other provision of law." The underlined phrase raises the question whether the limits of liabilities provided in the FWPCA was intended to supersede the Limitation of Liability Act or whether both sets of limits were intended to apply. This much debated issue appears now by the courts and commentors to be resolved in favor of the FWPCA's controlling position.

> "If [the 'notwithstanding clause'] modifies the language specifying the limitation of liability under the FWPCA, then the 'notwithstanding' language would seem to indicate Congress's intention that the FWPCA serve as the sole means by which a shipowner-polluter's liability could be limited, and the FWPCA would therefore supercede the Limitation Act of 1851." (Comment, 53 Tulane Law Review 1426).

And,

> "[a]t least as to federal oil spill cleanup costs, the language 'notwithstanding any other provision of law' . . . certainly appears to preclude application of the Liability Act. (In re Steuart Transp. Co., 435 F. Supp. 798, 806 n. 8 (E. D. Va. 1977).

Thus, although the Supreme Court has yet to construe the "notwithstanding any other provision law" language, the provision described above that the FWPCA has precluded the Limitation of Liability Act, has acquired the support of both case law and commentators. (Tug Ocean Prince, Inc. v. U.S., 584 F.2d 1151, 1162 (2nd Cir. 1978); Crow, op. cit., 53 Tulane Law Review 1127; 3 Benedict on Admiralty, §§4-7 (7th Edition, 1975) note 7 at 9-14; Gilmore and Black, p. 828; Healy & Paulson, Marine Oil Pollution and the Water Quality Improvement Act of 1970, 1 J. of Maritime Law and Commerce 537, 544, note 56 (1970); James J. Donovan, The Origins and Development of Limitation of Shipowner's Liability, 53 Tulane Law R. 999).

Although the other three acts have not been so fully commented on or construed, they undoubtedly are subject to the same general, logical analysis as that given the FWPCA. Here, Higgins may be authoritatively cited: "[T]he Trans Alaska Pipeline Authorization Act, the Outer Continental Shelf Lands Act, and the Deep Water Ports Act, contain limitation provisions that are separate and distinct from, and that supersede, those set forth in the Limitation of Liability Act." (Higgins, op. cit. 53 Tulane Law Review 1328, 1352).

State, Statutory and Common Law

The question as to whether the Limitation of Liability Act applies to the type of state statute described in the accompanying text was left open in the Askew case, when the Supreme Court had an opportunity to address it. The other issue is whether the LLA would have an effect on the Florida statute. However, two district court cases have spoken on the subject. In re Harbor Towing Corp., 335 F. Supp. 1250 (D. Md. 1971) and in the trial

level of In re Oswego Barge Corp., 439 F. Supp. 312 (N.D.N.Y. 1977), the courts both held that recoveries under the strict liability pollution statutes in Maryland and New York respectively were in fact limited by the Limitation of Liability Act. (See Crowe, 53 Tulane Law Review 1041.) And it is significant to note that the Maine statute, as pointed out earlier, went to great lengths to circumvent the possibility of the application of the Limitation of Liability Act, assuming that it would normally apply if special care was not taken to avoid it. The reader will recall that the care was to make the port facilities liable vicariously for damage done by incoming vessels. In a case construing the statute, the Supreme Court of Maine stated:

> "The state acknowledges in its brief that any suits against vessels for reimbursement, whether in a state or federal form, must be decided by applying fixed maritime law. This would include, of course, an application of federal liability limits." (Portland Pipe Line Corp. v. Environmental Improvement Commission)

However, in incidents involving other than removal costs, there is little reason why a shipowner entitled to general limitation should not be permitted to invoke the provisions of the federal Limitation of Liability Act. Higgins, op. cit., 1358. Thus, it would appear from the case law and commentary so far that it is more likely than not that state liability limitations statutes and compensation schemes might normally be subject to the federal Limitation of Liability Act limits, at least until the Supreme Court decides otherwise or there is a strong movement among the appellate courts in the country.

Finally, it should be remembered that a variety of ways exist around the Limitation of Liability Act. Congress may, of course, seek to narrow its scope or to exclude its liabilities in oil pollution, as in fact it has done in the recent statutes. State legislators may seek to circumvent the act as Maine did by assigning liability for carrier-caused damages to the terminals. And courts may widen the circumstances in which the limitation may be broken by their reading of the words "privity or knowledge." The trial court in the S.S. Queeny case did this by finding that the owners knew or must have known of defective mechanical conditions before its collision. (503 F. Supp. 337, 343-348). And the opportunity will undoubtedly be confronting the court in the Amoco Cadiz case regarding failure of the steering system. The liabilities in this case are being fought out on a maritime tort theory basis.

Appendix C

POSSIBLE REVISIONS TO THE OIL POLLUTION COMPENSATION REGIMES

Appendix C

POSSIBLE REVISIONS TO THE OIL POLLUTION COMPENSATION REGIMES

A. CURRENT STATUS OF PROPOSED CHANGES

1. Possible CLC/FUND Changes

In 1982 and 1983, discussions regarding proposed changes to the CLC/FUND conventions were underway. Discussions of the International Maritime Organization (IMO) Legal Committee were scheduled and discussions of specific amendments were tabled for consideration. These discussions are preparatory to the convening of a full IMO Diplomatic Conference in 1984, which will consider specific amendments to the CLC and FUND conventions.

Participation by national delegations to preparatory IMO Legal Committee meetings is underway. Suggested revisions are being proposed by national govermental agencies, the oil industry, independent tanker owners' associations, and other groups. Positions and counterpositions are being developed and refined.

This appendix identifies the areas in which changes to the TOVALOP/CRISTAL and CLC/FUND regimes are being discussed. It is important to review these issues because they indicate the future trends and changes that can occur in the regimes. The positions of the potentially liable groups--the cargo owners (primarily the oil companies), and the shipowners (primarily independent owners)--are identified. In addition, the positions of U.S. environmental interests, which may represent the interests of the spill-victim public, are discussed wherever it is possible to do so.

This appendix does not evaluate the validity of the interested groups' positions on any specific issue: it attempts to explain the issues, the nature of any possible changes, and the positions of the groups. Furthermore, the positions of the United States and other nations are not discussed because they are evolving, most frequently are not yet officially clarified, and are subject to continuing reevaluation on the basis of further analysis of the issues.

The general positions of the oil companies, shipowners, and environmental interest groups are consistent with their traditional economic, social and operating positions and objectives.

While all three groups recognize the importance of pollution compensation, the extent of this liability, limitations on liability, sharing of liability, and many other aspects of liability are the cause for disagreement. In general, cargo owners seek to limit their liabilities and to increase the responsibility of the shipowners and their P&I insurers to compensate for all noncatastrophic incidents, even if the increased cost of P&I insurance is passed back to cargo owners through tanker freight rates. The shipowner and P&I sectors also wish to limit their liability and to continue to share liability with the cargo owners. Environmental groups seek to increase the liabilities, responsibilities, and standards of performance by increasing cargo owner and/or shipowner liabilities.

The revision process for CLC/FUND is expected to enhance their effectiveness as the world's predominant pollution liability regimes. Given this view, the oil companies who pay for both CRISTAL and FUND seek to reduce and ultimately terminate the future roles of the voluntary and interim TOVALOP/CRISTAL regimes in favor of the CLC/FUND conventions. The oil companies' interests in this regard are represented by two industry groups: the Oil Companies International Marine Forum (OCIMF) and the Oil Companies Institute for Marine Pollution Compensation Limited (the Institute). The Institute administers CRISTAL from its Bermuda and London offices.

The interests of the independent tanker owners are represented to varying degrees by several international tanker groups, including the International Tanker Owners Pollution Federation Ltd. (which administers TOVALOP), the International Association of Independent Tanker Owners Ltd. (INTERTANKO), the International Chamber of Shipping (ICS), and other groups. The P&I Clubs also tend to represent and express the interests of the independent tanker owners on specific issues. Because independent tanker tonnage accounts for 60 percent of the world fleet, the influence of the independents tends to prevail in groups that have both oil-company fleet and independent fleet constituents, but the internal sensitivities to the divergent views complicates the positions of some groups. The presence of both oil company-owned and independent tanker tonnage in two of these three groups indicates the complex nature of the tanker owners' position. The discussion below outlines the position of these groups on the proposed changes.

The possible revisions to CLC/FUND essentially relate to two key aspects of the conventions:

- Scope of incidents, including other vessels, tankers in ballast, nonpersistent oils, geographic limits; and

- Scope of liabilities, including liabilities of CLC and FUND, limitations of liabilities, definition of damage, and coverage of preventive measures.

These possible changes are important to the present discussion because they may affect the costs and benefits to the United States of ratifying the CLC and FUND conventions. In both quantitative and qualitative terms, changes to CLC/FUND will affect the coverage, limits of liability of the conventions, and the payments made by U.S. cargo consignees. Perhaps of even greater significance is the relationship between the voluntary and interim regimes TOVALOP and CRISTAL. The results of the amendment process to the CLC and FUND conventions will have a major impact on the future of the TOVALOP and CRISTAL regimes, and potentially the continuing availability of oil pollution damage compensation in non-CLC/FUND nations.

2. Possible TOVALOP/CRISTAL Changes

The possibility of changes to the TOVALOP/CRISTAL regimes is complicated by the oil companies' desire to ultimately replace these regimes with CLC/FUND. The oil companies support wider ratification of CLC/FUND, particularly by the United States. At the same time, the oil companies are hesitant to increase the limits of liability under CRISTAL--increasing the liability of cargo interests--without a corresponding increase of shipowner's liability under TOVALOP. Furthermore, the oil companies feel that any positive movement in the TOVALOP/CRISTAL regimes, prior to the amendment process of CLC/FUND, might diminish the incentive for ratification of CLC/FUND. This delay in ratification would frustrate the oil companies' objective of terminating TOVALOP/CRISTAL and replacing them with CLC/FUND.

The oil companies support a "shadow" parity between the private regimes and CLC/FUND. The oil companies would probably press for this parity from TOVALOP with respect to shipowners' liability and would agree to a comparable "top off" liability from CRISTAL with respect to cargo owners' liability, to parallel CLC/FUND revisions over an interim period.

The oil companies can be expected to support revisions to TOVALOP/CRISTAL provisions if major progress is made in increasing the ratification and universality of CLC/FUND. The United States is clearly the key factor in this process. If the oil companies feel that extending TOVALOP/CRISTAL's life an additional three to five years and revising its provisions will permit the United States and other countries to ratify and implement CLC/FUND, they will oblige. If the oil companies feel that additional nations are not moving toward CLC/FUND ratification, they have the option of maintaining CRISTAL limits at the same, non-escalated levels, or even announcing a termination date. The oil companies would probably hope that this pressure would force the nations that have not ratified CLC/FUND to do so.

It is likely that the oil companies will strongly press for universal ratification of CLC/FUND in order to terminate CRISTAL. The oil companies feel that CRISTAL's official status as an interim regime (and TOVALOP's status as a voluntary regime) have been somewhat ignored and tnat diplomatic initiatives to replace CRISTAL (and TOVALOP) have been too slow.

Despite the oil companies' impatience, they remain sensitive to their individual corporate and industrywide responsibilities to participate in the cleanup of and compensation for oil pollution damage in countries that have not yet ratified CLC and FUND.

B. MAJOR CLC/FUND ISSUES AND POSITIONS

The possible revisions to CLC/FUND are presently a dynamic set of loosely related proposals that have stimulated actions and reactions by various segments of the marine legal, fleet-owning, and cargo-owning communities. The issues of concern to FUND, the IMO Legal Committee, OCIMF, the P&I Clubs, the ICS and governments are discussed below.

1. Ships to Be Covered

Ballast Tankers

This possible change relates to coverage for oil pollution damage caused by bulk oil tanker vessels (tankers, tank barges, and combination tank/dry cargo ships operating in the oil trade) in the ballast (unladen) condition. Typically these ships carry fuel oil, ballast water with very small traces of oil residue,

and oil slops from some or all of the ship's cargo tanks collected in dedicated slop oil tankage. The potential volume of oil spillage is limited and cannot approach the ship's full carrying capacity. TOVALOP covers ballast tankers at present.

The general view of all parties is that ballast tanker incidents should be covered under CLC. However, there is disagreement over whether these incidents should be covered by FUND, since no oil cargo is aboard the ship and the cargo-owning community has no participation in the oil involved in the incident. In the ballast condition, no oil contributing to FUND is aboard. It is also generally believed that CLC liability ceilings will cover all anticipated damages caused in the ballast condition. The tanker owners and P&I Clubs are generally in agreement with the position that ballast liability should be covered by CLC.

Other Types of Ships

Other possible changes would extend CLC/FUND coverage to ship types such as dry bulk ships, tankers in the grain trade, general cargo freighters, container and roll-off ships, gas carriers, chemical tankers, and others. This possible change is not favored by the oil tanker and cargo-owning communities or by the P&I Clubs because CLC/FUND were created to provide compensation for bulk oil transportation by sea. However, it has been proposed to extend coverage to oil/bulk/ore vessels during oil-laden voyages and perhaps on subsequent ballast voyages. Other ship types have other types of liability insurance, which have proven to be adequate to cover their oil pollution incidents. These ship types could not appropriately contribute to these conventions and could not participate in tanker industry actions and regulations to avoid incidents.

2. Oils to Be Covered--Extension to Nonpersistent Oils

The extension of the CLC and possibly the FUND convention to include nonpersistent oils is under discussion. Gasoline, No. 2 distillate fuel oils (such as diesel oil and home heating oil), kerosene, jet fuel, and naphtha would be the primary oils to be included. These oils have a high rate of evaporation and dispersion. This behavior can take time depending on the level of contamination of seas, soils, and beaches, and in some cases ongoing toxicity and pollution can continue due to the gradual release of nonpersistent oils from soil, sand, and other natural objects. Nonpersistent oils are frequently highly toxic until they disperse and ultimately evaporate. In some cases, such as major gasoline spills, they create a dangerous flammable situation that can restrict direct intervention because of the risks of explosion.

In general, marine interests do not support extension to nonpersistent oils, under either the CLC or the FUND. Several governments, and environmental interests, support inclusion of nonpersistents, particularly under CLC. While nonpersistent oil is not viewed as the major issue facing CLC and FUND, it may prove to be complex to deal with.

Several factors act to limit the potential for major nonpersistent oil spills, and the potential cleanup and damage costs associated with such spills. First, nonpersistent oils are carried in smaller cargo lots, often segregated in separate tanks aboard petroleum products tankers. This tends to result in slower loading and discharge rates under particularly careful controls, owing to the importance of separating the different, high-value cargoes and the extreme flammability of nonpersisent oils. Second, nonpersistents are rarely carried in vessels larger than 40,000 to 50,000 DWT. The smaller vessels employed--as compared with crude oil tankers, for instance--act to limit the potential for a major spill of nonpersistent oil.

Another issue connected with including nonpersistent oils is the fact that they are not included in contributing oil receipts. Altering the definition of contributing oil would add to the complexity of administering FUND, particularly due to the larger number and variety of nonpersistent oil receivers. On the other hand, maintaining the existing definition of contributing oil might be inappropriate, since nonpersistent oil shipments are not necessarily directly related to seaborne crude oil or heavy products receipts.

One concern of governments is that pre-spill preventive measures can be particularly important and costly in the case of nonpersistent oil spills. At present, CLC does not establish any liability for nonpersistent spills and government agencies have no way to recover for preventive or cleanup measures. Therefore, it would be important to include nonpersistent spills under the conventions. If CLC limits are raised, inclusion under CLC alone might be sufficient to cover most pre-spill costs.

A final complication is that the IMO Legal Committee is also drafting a convention on the carriage of hazardous and noxious substances by sea. This convention may more appropriately cover nonpersistents than would CLC and FUND.

Despite the reluctance of the marine community to include nonpersistent oils, this issue may not receive the attention that the revision of CLC and FUND limits will, since the financial implications are not likely to be as great.

3. Geographic Scope of Coverage

CLC and FUND currently cover pollution damage occurring on the territory or in the territorial sea of a ratifying state. A possible change would permit ratifying countries to extend coverage beyond their territorial seas, to include the 200-mile Exclusive Economic Zone (EEZ). The marine community opposes any change to the CLC and FUND coverage. The community feels that the territorial sea provides ample protection for a nation's interests.

Resistance is based on a concern that nations could claim damages for spills in "open seas" where no demonstrable direct economic damage occurred. The feeling is that if a major spill occurs that can affect a nation, it will come ashore at some place and at some time. The ANTONIO GRAMSCI spill in the Baltic and INDEPENDENTA spill in the Bosphorus (see Chapter II) are examples that underscore the concern of the marine community. In both cases, claims included theoretical damages for spilled oil that did no demonstrable damage to the claiming nation's economic interests and territorial seas.

U.S. environmental groups tend to favor extension of convention coverage to the EEZ. This would permit compensation to be claimed and paid for damage to valuable fishing grounds, such as Georges Bank, and other natural resources. The marine community disagrees, pointing to the possible increase in theoretical and speculative claims that they feel would result from such an extension.

Both CLC and FUND specifically cover post-spill preventive measures inside or outside the territorial sea. The marine community does not call for any change in these provisions.

4. Pre-Spill Preventive Measures

This possible change relates to revision of CLC and FUND to specifically include pre-spill preventive measures, whether or not an escape or discharge of ol ultimately occurs. At present, the language is ambiguous, but seems to cover preventive measures only after a spill occurs.

There is general consensus in support of such a change. If the discharger can recover pre-spill prevention costs from his limitation fund under CLC, he will have an incentive to take early action in order to prevent a spill from occurring. Similarly, recovery for government actions, which may be more effective prior to a spill than afterwards, would be covered. In some

cases, action has been delayed because of a lack of evidence of an actual oil spillage oil from the tank vessel. Furthermore, coverage of reasonable preventive measures would eliminate the litigation that results from FUND's current limitation of coverage to ships that have actually discharged oil. The TARPENBEK case (see Appendix D) is one such example where a P&I Club is suing FUND to recover some expenses related to preventive measures. Little, if any, opposition to this possible change is anticipated. It is also common that the cost of preventive measures can be covered under cargo salvage, ship salvage, or wreck removal and as such some or all of the cost of these activities is already borne by other P&I insurance provisions.

The major point of discussion on this issue concerns what "trigger" would be applied to include the pre-spill preventive actions. One possibility is the use of the words "serious" threat of an oil "discharge," consistent with the FWPCA wording. Another possibility is "grave and imminent danger" to a coastline or related interests from a "threat of pollution of the sea by oil;" this wording comes from the 1969 Convention Relating to Intervention on the High Seas in Case of Oil Pollution Casualties. The oil industry's position is "a grave and imminent threat of the escape or discharge which, if it in fact occurred, would create a serious danger that pollution damage would result." The "serious" threat trigger is generally regarded as less restrictive than the "grave and imminent threat" trigger, but the positions of all concerned do not appear to be too far apart.

5. Definition of Pollution Damage

This possible change relates to the improvement of the definition of pollution damage. The marine industry supports tightening the definition of pollution damages. Ratifying countries that have developed theoretical calculations that support claims without relating them to damage to specific persons are expected to resist these changes.

The marine community wishes to reduce the cost of speculative or remote claims. Claims that a spill on the sea surface spoils the entire column of water beneath the spill, or claims for the cost of replacing vegetation without any intention to do so, are considered examples of speculative and theoretical claims. Improvement of the definition of pollution damage should eliminate the potential for unjustified or economic or environmental claims by governments or individuals. All liable parties would support definitions that are consistent with the intent of the conventions, but that limit their liabilities for nonpollution damages or specious claims.

6. Limitation of Liability

In contrast to the possible changes discussed above, changes to the levels of liability are quantifiable and have a direct and immediate effect on shipowners and cargo owners, the insurance community, and claimants. Proposed changes to the limits of CLC and FUND liabilities stem from three issues:

- The distribution of liabilities between shipowner and cargo owners
- The experience of recent years
- A concern for preserving the real value of liabilities in line with world inflation.

The specific values of liability limitation will be subject to intensive negotiation in the IMO Legal Committee meetings and at the full Diplomatic Conference in 1984. What is clear is that member nations and the oil companies will press for substantial increases in CLC and FUND liability limitations. The shipowners and their P&I Clubs accept the need for some increase in CLC limits, but do not accept the opening positions of the oil companies.

Overall Fund Limit

It is likely that the combined CLC/FUND limits of liability will be increased substantially, under the pressure of several member nations. Overall FUND limits of $200 to $300 million have been mentioned by several governments, including the U.K. and France. Studies by the OECD have also supported the need for higher limits, noting that oil pollution spill cleanup and damage costs have increased more rapidly than general inflation because of more thorough response efforts, higher cleanup standards, more detailed identification of damage, and greater general awareness. The oil companies proposed in the OCIMF Oil Spill Pollution Liability and Compensation Position Paper of July 1982 that a combined ceiling of $125 million per incident be established.

It is important to note that ratification of new limits by member nations can take several years and that during the intervening period the real value of these limitations will decline. For example, assuming a 5 percent per year inflation rate, the $125 million limit proposed by the oil companies in 1982 would have a real 1982 value of $113 million in 1984 when the proposed Diplomatic Conference would meet to agree on such a limit. Five

years later, when the revised conventions might enter into force, the limitation's real 1982 value would have declined to $89 million.

Shipowners' Liability

Possible changes to shipowners' liability under CLC pertain to raising the level of limitation and to adopting a fixed limit regardless of ship size. At the present time, shipowners' liability is proportional to ship size with no minimum limitation. (In a side letter of understanding between CRISTAL and the P&I Clubs, minimum liability is set at $1 million.) Liabilities increase to $15.4 million for ships of about 100,000 convention tons (approximately 250,000 DWT ships with gross tonnages of about 125,000 tons).

Actual spill experience has shown that small ship spills are relatively costly per ship ton and frequently exceed $1 million. The oil companies have proposed a flat $50 million liability tranche for shipowners, with $125 million FUND maximum above that, but have acknowledged that this position might have to be modified. They alternatively proposed a minimum $20 million liability for tankers up to 60,000 convention tons and a limit of $20 million plus $875 per convention ton for tankers over 60,000 convention tons up to a $55 million limit. FUND would provide a "top-off" coverage of $70 million for a total $125 million coverage.

Independent shipowners, their industry groups, and the P&I community strongly oppose a flat liability notion, believing that the concept reverses longstanding ship-size-related standards of assessment for maritime liability. They believe that a flat tranche would unduly penalize small ships, which by definition compete against larger, more efficient, ships.

The proposed $50 million shipowner limit of liability is an opening position by the oil companies that will very likely be negotiated downward during the amendment process. Minimum liabilities of $5 to $10 million were mentioned to TBS by the P&I Clubs and shipping interests as being high but possible limits. The minimum limit for small ships will be a major determinant of the frequency that FUND will be called on to top-off CLC compensation. If the CLC's limit is raised to a high enough level, the FUND's activity could be restricted to very infrequent catastrophic spills by large tankers.

The CLC limit of liability represents a very sensitive area of contention between shipowning and cargo interests. Shipowners

point to a desired sharing of liability between shipowners and cargo owners, claiming that the inherent characteristics of persistent oils cause pollution clean-up expenses and damages and that cargo owners have an obligation to participate in the payment of claims in many cases, and not just in the case of catastrophic spills.

The oil companies maintain that the responsibility for transportation lies with the shipowner and that the FUND's limit was originally selected to cover liabilities in catastrophic circumstances and to provide complementary liability coverage above the CLC limits that were perceived in 1969 when the capacity of the P&I insurance markets was unknown. The oil companies point to the ample capacity of the P&I insurance markets and the P&I Clubs' ability to rapidly increase oil pollution coverage since the original coverage provided in 1969. The disagreement between shipowners and cargo owners is deep, and its outcome is considered vital to the economic interests of both parties.

Updating Liability Limits

There is a concern that CLC and FUND liability limits need to be periodically updated in order to maintain the real value of coverage and to meet changing need and responsibilities of the conventions in the future. In general, no strong opposition to this possible change comes from any sector. The oil companies strongly support such a provision and the shipowning and P&I communities are resigned to some revision capability. Indexation is not considered desirable--a deliberate and periodic review and modification is preferred. Simultaneous and coordinated revisions of CLC and FUND limits would be necessary to preserve the effectiveness of the conventions.

Standards for Breaking Liability

The possible changes pertain to reducing the potential for misinterpretation of shipowners' limitation of liability and efforts to break shipowners' liability under CLC in order to claim damages outside of the conventions. The oil companies propose to replace the unclear CLC language with the language of the 1976 Convention on Limitation of Liability for Maritime Claims (CLLM): "a person liable shall not be entitled to limit his liability if it is proved that the loss resulted from his personal act or omission committed with intent to cause such loss or recklessness and with knowledge that such a loss would probably result."

Shipowners and the P&I Clubs would support such a change. U.S. environmental groups favor retention of the current shipowners' liabilities language. They agree that it is easier to break shipowner limits of liability under the existing CLC/FUND language than under the 1976 CLLM. They favor retention so that limits can be broken and recourse can be available from the shipowner, and the insurance available from his P&I coverage.

Owner's Fund as Pre-Requisite for Limitation of Liability

At present, under the CLC, a shipowner can only establish his right to limit his liability after (a) the institution of an action in the appropriate court, and (b) the deposit of the owner's limitation fund in that court. However, courts have sometimes been reluctant to entertain actions brought before them when it appears that the parties are willing to settle amicably.

The problem is that the FUND cannot compensate damaged persons until the owner's right to limit liability has been established. There have been cases where the FUND was prepared to pay out compensation but was precluded from doing so until these technical prerequisites had been met.

Proposed solutions to this problem include either removing the requirement that the shipowner establish the fund, or simply eliminating the prerequisite of filing an action. The second alternative--requiring the establishment of a shipowner's fund, but allowing the shipowner to establish the fund in a competent court even if no action has been filed against him--appears to offer the same level of security to potential claimants, while at the same time possibly accelerating the settlement process.

7. Liability

Shipowner Indemnification by Cargo Owner

Changes in shipowner indemnification relate to the possible elimination of shipowner CLC indemnification (frequently called rollback) by FUND. This rollback provision reduces maximum shipowner liability from about $147 per convention ton (maximum $15.4 million per incident) to $110 per ton or $9.2 million, whichever is less. The oil companies favor elimination of the rollback, because they believe the $10 million maximum liability is too low given the costs of noncatastrophic spills and the

capacity of the insurance markets to cover additional shipowner liability. It is also argued that the rollback was an historical compromise solution which could be eliminated by agreeing on a new split between owners and cargo interests.

The shipowners contend that the rollback is an important component of the sharing of liability principle between shipowner and cargo owner. The rollback represents splitting the difference between the old 1957 Limitation of Liability Convention (1,000 gold francs per ton) and the CLC (2,000 gold francs per ton). The elimination of rollback should, they argue, be considered an increase in their actual liability under CLC and should at a minimum be accompanied by an increase in FUND top-off capacity. The shipowners and the P&I Clubs believe that some linkage between CLC and FUND changes in liability should be maintained. A one to ten ratio was mentioned by some. In this case a $1 million increase in CLC liability limits would be accompanied by $10 million increase in FUND liability coverage.

The oil companies believe that the rollback is an anachronism based on the historical concern that shipowner's assumption of the CLC liability might place too large a burden on the shipowner because of a shortage of insurance capacity. They maintain that the capacity exists and that CLC can now provide all of the routine noncatastrophic, nonmajor incident coverage. The shipowners strongly disagree.

Channelling

Changes to CLC in this area would seek to channel the liability of other parties exclusively to the shipowner, and to restrict his right of recourse. This and would eliminate claimants' ability to claim compensation from the charterers of the tanker vessel, its operators and managers, crew members, pilots, salvage contractors, and all servants and agents of these parties. At present, only the liability of a shipowner's servants and agents is channelled to the shipowner himself, and there are no restrictions placed on the shipowner's right of recourse. Shipowners, oil companies, and the insurance community generally support this change in order to reduce insurance costs and avoid litigation and other delays. Several governments are not yet convinced that these savings justify such a restriction of liability.

Aids to Navigation Defense

This possible change relates to the current CLC provision that the shipowner can defend against liability for pollution damage if the damage was wholly caused by the negligence or other wrongful act of any government or other authority responsible for the maintenance of lights or other navigational aids in the excercise of that function.

The shipowners and the P&I community strongly support retention of this defense and its possible expansion. Some governments would like to eliminate it. Governments generally feel that shipowners should be liable at all times and that reliance on aids that may move due to natural events is a problem that is within their responsibility.

Definition of Tonnage

This possible change would replace the limitation tonnage used to calculate shipowners' liability with the more widely used gross tonnage of the ship as specified in the 1969 Convention of Tonnage Measurement of ships. This would avoid problems with calculating limitation tonnage (convention tonnage) for some ships. Limitation tonnage is currently calculated by adding engine room space to the ship's net tonnage. There is general support for this possible change because of its simplicity and the universality of gross tonnage measurements.

Treaty Law Issues

Treaty law issues relate to the processing of convention changes and issues surrounding the interim between the finalization of revised CLC and FUND conventions and their entry into force after ratification. The issues relate to the form of the revision instruments, the liabilities that should apply during the revision process, the role of the current system for states that ratified the amendment conventions, and entry into force procedures.

Examples of these issues would include potential incidents in which the ship of a nation that has ratified existing conventions creates oil pollution damage in a nation that has ratified the amended convention, or where an incident affects the territorial seas of two nations, one of which has ratified the current conventions and one of which has ratified amended conventions.

Inter-Relations of Possible Revisions

Many of the areas in which revisions are being discussed are closely inter-related. This will make the negotiation of a final set of revisions at the 1984 Diplomatic Conference quite complex. For instance, pre-spill preventive measures could have a far-reaching effect if both geographical coverage is extended and the conventions are revised to include non-persistent oils. The definition of pollution damage is related to the nonpersistent oil issue. The setting of revised FUND limits will be critical to the adequacy of coverage from the potential victim's point of view, but the sharing of the burden between shipowners and oil receivers may also be a contentious issue. The level to which these limits are raised may influence the outlook of different nations on broadening the scope of coverage of CLC and FUND. Treaty law issues are also related to revised levels, affecting how quickly new limits would be placed into effect.

Appendix D

TANKER OIL SPILL CASE STUDIES

Appendix D

TANKER OIL SPILL CASE STUDIES

Contents

OIL SPILL CASE STUDIES:
REGIMES INVOLVED AND ISSUES RAISED

Spill Incident Vessel Name	----Regimes Involved----			----Issues Raised----							
	U.S. Spill	Fund	Cristal	Coverage of Regimes	Pre-Spill Preventive Measures	Definition of Pollution Damages	Persistent/ Non-Persistent	Jurisdiction	Shipowner's Right to Limitation	Nations with Unlimited Liability	Reasonableness of Claims
AMOCO CADIZ			X			X		X	X		
ANTONIO GRAMSCI		X	X			X					X
ARIES	X										
BETELGEUSE			X						X	X	
BURMAH AGATE	X			X							
CHEVRON HAWAII	X		X								
CONCHO	X										
DONA MARIKA							X				
EDGAR M. QUEENY	X		X						X		
ELENI V			X						X		
ESSO BAYWAY	X										
ESSO INDONESIA				X							
ETHEL H	X		X								
FUKUTOKU MARU NO. 8		X							X		
GLOBE ASSIMI		X				X					
HOSEI MARU		X							X		
HYGRADE 95	X										
INDEPENDENTA						X				X	X
JOSE MARTI		X		X							
JUAN ANTONIO LAVELLEJA							X				
KURDISTAN			X	X					X		
NEPCO 140	X							X	X		
ONDINA		X									X
PRINCESS ANNE MARIE			X			X				X	X
RICHARD C. SAUER	X										
SANSINENA	X										
TANIO		X		X					X		X
TARPENBEK		X		X	X						
ZOE COLOCOTRONI	X					X			X		X

AMOCO CADIZ

The Liberian-flag, 224,914 DWT tanker AMOCO CADIZ grounded off Portsall, France, on March 16, 1978, spilling over 220,000 tons of crude oil into the English Channel and along the Brittany Coast.

Defendants in the various cases flowing from the casualty include Amoco International Oil Co., Amoco Transport Co., Standard Oil Co. (Indiana), Claude Philips (manager of marine operations at Amoco International), Astilleros Espanoles SA (builders of the vessel), Bugsier Reederei and Bergungs A.G. (salvage company), and the Republic of France (for inadequate spill cleanup measures).

A group of French citizens represented by the Union Departemental des Associations Familiales de Finisterre (UDAF) brought a $200 million suit for economic and moral damages against the four Amoco parties in federal district court in Chicago on September 25, 1978. The same group filed a $1.2 billion claim on November 3, 1978, against the shipbuilders (Astilleros Espanoles), alleging an inadequate steering mechanism and inadequate instructions for its use. Another group of French communes and associations filed a $483 million claim in Chicago.

Amoco initially contended (in late 1978) that, as the shipowner, its liability was limited to the value of the vessel after the grounding.

French plaintiffs filed for $384.5 million against the salvage company Bugsier Reederei in connection with efforts by the salvage tug PACIFIC, alleging that it was unseaworthy and that Bugsier failed to exercise proper care in salvaging the AMOCO CADIZ. Attorneys attached the sister-ship ATLANTIC in Norfolk, Virginia, on December 30, 1979, and established the jurisdiction over Bugsier of the U.S. District Court of Eastern Virginia (DCEV). The vessel was released by the French claimants when they received a letter of undertaking from Bugsier guaranteeing that they would pay at least $10 million of any proven claims and appear in U.S. district court in connection with the claims.

Amoco then reattached the ATLANTIC, claiming that Bugsier's negligence caused the AMOCO CADIZ grounding, and contending that Bugsier should pay all damage claims resulting from tne spill

AMOCO CADIZ cont'd.

and an additional $50 million to cover the loss of the ship, its cargo, and expenses incurred by Amoco. Amoco also received a letter of undertaking from Bugsier. Both letters were underwritten by the United Kingdom P&I Club of London.

Bugsier attempted (June 1979) to have the DCEV find that it had no jurisdiction. Both Amoco and French claimants argued that the Bugsier cases should remain in the United States to ensure a unified judgment in the case.

On June 4, 1979, the Judicial Panel on Multidistrict Litigation of the U.S. Courts ordered that all federal court proceedings in the AMOCO CADIZ case be consolidated for pretrial proceedings under Judge Frank V. McGarr of the U.S. District Court of Northern Illinois in Chicago. This ruling automatically transferred all claims filed in U.S. District Court of Southern New York and the DCEV. It did not affect the class action suits filed against Amoco by French plaintiffs in the Illinois Circuit Court of Cook County.

In July 1979, Amoco withdrew a motion to dismiss damage claims filed against it in U.S. courts. Amoco had argued that France was a more convenient forum for the case than the United States, and that CLC, which France had ratified, specifies that all claims must be brought in the country harmed by the spill.

In September 1979, Judge McGarr denied a motion by the Republic of France to dismiss a complaint by Amoco against France. The complaint charged France with negligence:

1. France had no proper contingency plan

2. The French misused dispersants, etc.

3. Many oysters were unnecessarily destroyed.

Judge McGarr agreed to a French request that damage awards and damage liability be determined in separate legal proceedings.

In France, the shipowner's liability would be determined under CLC, since France had joined CLC at the time of the spill and CLC was in force. FUND is not involved since it only entered into force on October 16, 1978, and covered incidents occurring after February 1979. CRISTAL has already received a claim of $4.455 million from the U.K. government. The French government has not yet quantified its claim to CRISTAL, but in the current U.S. Court proceedings it is reported to be claiming

AMOCO CADIZ cont'd.

$2.2 billion from the shipowner. There will also be a claim on CRISTAL by the shipowner for oil spill cleanup costs.

This case is complex because not only are the plaintiffs appealing to an unusual jurisdiction (CLC states that legal action should take place in the state suffering the damage) at least partially to escape the CLC limits, but they are also pursuing parties other than the vessel owners. The liability issue is presently being decided. If the court finds, under the Limitation of Liability Act, that the owner is able to limit his liability ($800,000 in this case--the value of the vessel after the accident, plus pending freight), the damaged parties retain the possibility of going back to France, where a $16.735 million limitation fund was established by the P&I Club in Brest six weeks after the incident. By simply showing damages above that amount, they could immediately receive this amount, plus a balance of $13.3 million from CRISTAL (to reach the $30 million CRISTAL limit then in effect).

However, since the concept of owner's fault or privity is generally defined more broadly in the United States than in CLC countries, the plaintiff may have a chance of breaking the owner's right to limitation. The settlement could then be substantial. While the French claims are not fully documented yet, provable damages may amount to between $150 and $350 million. The P&I Club has already expended $16.7 million for the limitation fund, $4 million for cleanup costs paid by the owner, and $12 million in legal fees.

In addition, the plaintiffs are attacking the Amoco department that was actively managing the vessel, and the parent company as well. A finding of fault or privity against any of these parties would open the possibility of the French plaintiffs obtaining many times the damages they would have received under CLC and CRISTAL.

In deciding the liability issue, the court will be determining whether a tortious liability arises from the condition of the steering gear. However, the tug owners and the government of France are also co-defendants in the case, and the judge may apportion liability across all the defendants.

In the damage case--separated from the liability issue--a key issue is whether the French government has a <u>parens patria</u> responsibility for the number of organisms in the sea. While the straight cleanup costs were on the order of $150 million, natural resource damages, if provable, could add another $200 million or so.

AMOCO CADIZ cont'd.

Meanwhile, five years after the incident, settlement has not yet been reached.

One direct result of the AMOCO CADIZ incident was that the P&I cover for oil pollution was raised shortly afterward from $50 million to $300 million. This may have been in response to requests from the oil majors, who realized their potential vulnerability to suits such as this one.

ANTONIO GRAMSCI

The 40,000 DWT Soviet tanker ANTONIO GRAMSCI grounded on February 27, 1979, in the Baltic Sea off Ventspils, U.S.S.R., spilling about 5,500 tons of crude oil. The Swedish government claimed that the oil pollution of more than 10,000 islands in the Stockholm archipelago a few weeks later was caused by spilled oil from the tanker, and sample analyses by Sweden, FUND's surveyors, and Soviet scientists substantiated the claim. Damages were also incurred in the U.S.S.R. and in Finland.

Memberships in CLC, FUND, and CRISTAL at the time of the incident were as follows:

- Sweden--CLC and FUND
- Finland--neither
- U.S.S.R.--CLC only
- Cargo owner--CRISTAL

Cleanup operations in Sweden cost about 112 million Swedish krona ($25.2 million). The Swedish Government made a partial claim for about $15.7 million in damages from the shipowner, Latvian Shipping Co., in the City Court of Stockholm. Under CLC, however, the owner was able to limit its liability to about $3.7 million. A court in Riga, U.S.S.R., which had jurisdiction under CLC due to the location of the spill and cleanup efforts, awarded almost 4 million krona (about $920,000) to Sweden and the remainder of the $3.7 million to the U.S.S.R. This apportionment was based on the fact that the U.S.S.R. had already claimed about $74.8 million in damages, more than three times as much as the Swedish claim.

FUND agreed in March 1980 to reimburse the Swedish government. An amount of 96 million krona (about $20 million) was paid in January 1981. No payment of indemnification under FUND was due since the vessel was flying the flag of a noncontracting State. No CRISTAL payments have yet been made.

There are no TOVALOP benefits in this case because CLC applied to the claims of Sweden and the U.S.S.R. However, CRISTAL benefits will likely be made available to claimants in Finland and the U.S.S.R. although such benefits, under CRISTAL'S terms in such circumstances, are abated. (CRISTAL will

ANTONIO GRAMSCI cont'd.

pay only to the point that payments from all other funds, such as FUND, and the CRISTAL payment, do not exceed $36 million.) The Finnish claim of $2.7 million has been received by CRISTAL, but the Soviet claim ($94.8 million so far) may not yet be complete. The bulk of the Soviet claim to CRISTAL ($63.8 million) was for damages to natural resources and costs for restoring "polluted waters to a clean condition," though this was a hypothetical amount based on a formula whose only variable was the quantity of oil spilled. The remainder of the Soviet claim was for fishermen's compensation ($27.0 million) and for spill cleanup ($4.0 million). CRISTAL will pay the U.S.S.R. and Finland their pro-rated shares (considering the FUND payment to Sweden) up to the $36 million limit.

In response to the Soviet claim relating to the ANTONIO GRAMSCI, the FUND's Assembly adopted a resolution recognizing the problem of evaluating ecological damages from spills, but asserting that damage assessments for the purpose of compensation by FUND cannot be based on "abstract quantification of damage calculated in accordance with theoretical models." Although the U.S.S.R, because it is not a member, did not claim against FUND, the major allocation of CLC funds to the U.S.S.R. reduced the amount of CLC money available to Sweden and hence raised FUND's payment to Sweden.

ARIES

On December 3, 1978, the U.S.-flag 24,906 DWT tanker ARIES spilled about 2,250 tons of No. 6 fuel oil in Charleston, South Carolina, when a tank overflowed while the vessel was offloading at a Hess dock on the Cooper River. Cleanup operations were conducted by the Coast Guard, and included impacted river banks, rip-rap, and marsh grass. The Coast Guard received payment from Avon Steamship Co., Inc. of Lake Success, New York, the owners of the ARIES, for recovery of the cleanup costs in November 1981.

BETELGEUSE

The 121,430 DWT French tanker BETELGEUSE exploded while offloading at the Gulf Oil Terminal at Whiddy Island in Bantry Bay, Ireland, on January 8, 1979. Between 20,000 and 27,000 tons of crude oil were spilled, and 51 persons were killed. Much of the oil burned during a day-long fire following the explosion. The jetty was seriously damaged as well, which affected the refinery's ability to operate.

After pumping remaining oil out of the bow section, it was towed on February 9 to a shallow-water anchorage and examined. It was then towed to deep water and sunk on February 23, 1979.

A tribunal convened by the government of Ireland found that the major share of responsibility for the casualty lay with the shipowner, Total Compagnie Francaise de Navigation. The hull was seriously weakened due to failure to replace the ship's cathodic hull protection system, and excessive null stresses were created by incorrect ballasting procedures during the offloading. In addition, the vessel was not equipped with an inert gas system.

Gulf Oil, the terminal operator, contributed to the disaster, according to the tribunal, because

1. The dispatcher at the terminal control room was absent when the ship initially buckled;

2. The standby tug was moored too far away (4.5 km from the jetty); and

3. Adequate escape boats were not available at the terminal.

Ireland was not then, and is not now, a member of CLC or FUND. However, the vessel was entered in TOVALOP and the oil was covered by CRISTAL. Total amounts claimed to November 15, 1982, according to CRISTAL, are $22.1 million (at exchange rates of November 1982). There will also be a claim from the Irish government in addition to this amount. The shipowner's gross limitation ($160 per convention tcn) is $9.0 million. Other possible sources of compensation (to be exhausted before CRISTAL would pay) include the shipowners.

Complex suits and claims negotiations are likely to take a long time to resolve in this case.

BURMAH AGATE

The Liberian tanker BURMAH AGATE collided with the freighter MIMOSA in the Gulf of Mexico on November 1, 1979, 5 miles outside the entrance to Galveston harbor. The BURMAH AGATE was carrying 16.4 million gallons of oil. The BURMAH AGATE exploded on colliding and burned for nine weeks to January 8, 1980. Eventually 5.7 million gallons of oil were recovered from the tanker; of the remaining 10.7 million gallons, 80 percent was estimated to have burned, and 20 percent spilled. On February 19, 1980, salvors towed the BURMAH AGATE to Brownsville, Texas, for salvage.

The spill cleanup operation was handled by the vessel's charterers, Burmah Oil Company, and a P&I Club representative directed the funding of the operation. Total claims were originally \$7.6 million, which included direct payments to contractors and estimated costs to the U.S. Government of \$3.4 million for spill cleanup. Subsequently, the Government has amended its claim to \$5.2 million, and this is currently the subject of litigation. All the cleanup costs were paid within about two months, except for the government claims. The only additional notice of a third-party claim was made by the State of Texas. This amounted to \$75,000 but has yet to be substantiated.

For this case, the limitation figure for cleanup under the FWPCA would have been about \$4.8 million. Initial advice was that the fire could be contained and extinguished relatively quickly, with the result that pollution prevention and clean-up costs were expected to be below the limitation figure. The bareboat charterers took responsibility, but because of the unexpectedly long time during which the tanker continued to burn, they incurred greater costs than if they had established a limitation fund at the outset and left the cleanup to the Coast Guard. This is an example of the economic decision that must be taken by the owners and P&I Club during the critical early hours of a spill.

It was initially believed that this was a CRISTAL cargo. However, due to transfers of title to the oil cargo during the voyage, it was apparently not a CRISTAL cargo at the time of the incident, and no claim has been filed with CRISTAL.

CHEVRON HAWAII

The 71,339 DWT tanker CHEVRON HAWAII containing crude oil exploded and caught fire on September 1, 1979, when it was apparently hit by lightning in the Houston ship channel. The fire spread to a storage tank containing 1.2 million gallons of ethyl alcohol and to a nearby Shell Oil dock where four barges containing crude oil and gasoline were moored (three of these barges sank after catching fire). The CHEVRON HAWAII contained 2.1 million gallons of oil when it exploded, and about 750,000 gallons of crude oil were spilled. Shell supervised and financed the cleanup to September 9, Chevron took over on September 10, but Shell continued as Chevron's agent. Cleanup was completed by early November (630,000 gallons were recovered), when the State of Texas, U.S. Fish and Wildlife, and the U.S. Coast Guard agreed the operation could be secured. Total cleanup cost was about $8 million.

Damages included claims resulting from oil clouds raining down on houses, $20 million of pier damage, the barges damaged, and people killed; all distinct from oil pollution damage. There were also salvage and wreck removal activities.

In this case, the terminal and vessel owners took responsibility for the cleanup effort. A P&I Club representative was on-scene. Under the FWPCA, the owner might have limited liability to about $5.3 million. However, the owner was insured under TOVALOP terms and the cargo was a CRISTAL cargo. Therefore, there were more funds available for the cleanup effort than would have been available under the owner's FWPCA limit. The owner also received the CRISTAL rollback for pollution costs above $120 per convention ton. The owner's (P&I Club's) share was thus $3.8 million, with CRISTAL contributing the $4.2 million balance. CRISTAL agreed to include the oily rain fallout as pollution damages; another regime might not have adopted this definition. The CRISTAL payment was made in March 1981, 18 months after the incident. The government did not incur any substantial direct expenses, and there was no litigation in this spill incident.

CONCHO

The 18,681 GRT U.S.-flag tanker CONCHO struck a submerged object in New York harbor on January 19, 1981, spilling No. 6 heavy fuel oil. The vessel's owners initially thought that the incident might be attributable to government error (uncharted obstruction). Because of their experience with a previous case (the COLORADO) where this had occurred and the owners had difficulty recovering their costs, the owners initially declined to take responsibility and the Coast Guard consequently undertook the spill cleanup. The owners then determined that there was no government fault in the case, and stepped in and completed the cleanup. A spill cleanup manager/claims assessor retained by the P&I Club handled the spill.

Costs involved were Coast Guard expenditures ($280,000), payments to contractors ($100,000), cleanup of an Exxon pier ($65,000) and other third-party claims, for a total of about $450,000. The reimbursement of the Coast Guard was somewhat delayed but payment was effected in January 1983, some 24 months after the incident. There was some adjustment of Exxon's claim, to separate the cost incurred in cleaning the pier from costs involved in unloading the vessel's cargo. Also, expenses incurred by the owner in checking the hull condition after the incident were determined to be for the owner's account (hull and machinery insurance), and not pollution damage covered under P&I insurance.

There was no litigation in this case. The total costs were $35 per GRT, well below TOVALOP (or FWPCA) limits.

DONA MARIKA

The 11,000 DWT Liberian-registered tanker DONA MARIKA ran aground in Milford Haven, United Kingdom, on August 5, 1973, spilling 3,000 tons of Esso 4 Star gasoline. This spill, though not covered by any of the regimes under study, involved potential natural resource damages due to nonpersistent oils. Because of the risk of explosion from the spilled gasoline, the normal anti-pollution measures were not used. Once petroleum gas concentrations had dropped sufficiently, the remaining cargo was transferred to a shallow-draft tanker. There were essentially no cleanup costs, only cargo salvage and wreck removal.

Studies performed by the government fisheries laboratory indicated that fauna in the bay were severely affected; Molluscs, particularly limpets, were killed. This occurred because the rate of spillage in the confined area exceeded the evaporative output, and water-in-gasoline emulsions were formed.

The spilled gasoline contained lead, and the possibility of lead poisoning was therefore investigated. It was found that there was no evidence of lead accumulation in the area near the accident. Also, the rocks along the shore exhibited no obvious traces of gasoline one week after the accident.

In summary, this spill caused some damage to local fauna, though no significant deaths of birds or fish were reported. There were no adverse health effects on humans, and no lasting physical contamination of the area.

Source: Marine Pollution Bulletin, December 1973, pp. 181-183.

EDGAR M. QUEENY

The 19,046 GRT chemical carrier EDGAR M. QUEENY rammed the Liberian tanker CORINTHOS (loaded with crude oil) as it was docked at a British Petroleum/Sohio Facility on the Delaware River at Marcus Hook, Pennsylvania, in January 1975. The EDGAR M. QUEENY was making a 180-degree turn in the river, when it ran into the CORINTHOS, which exploded, killing 26 people, causing extensive damage to the pier, sinking the tankship CORINTHOS, and causing oil pollution.

This case raises two interesting points. First, litigation resulted in a finding by the courts that the owner's right to limitation could be broken because a defect within the owner's privity contributed to the accident. Second, the P&I Club and CRISTAL paid the cleanup costs relatively promptly, and long before the litigation was decided.

The owner-trustee of the EDGAR M. QUEENY, Bankers Trust Co., and its charterers, Monsanto Co. and Keystone Shipping Co., filed a motion in the U.S. District Court seeking "exoneration from and limitation of liability" under the 1851 Limitation of Liability Act.

In February 1980, Judge Charles R. Weiner of the U.S. District Court for the Eastern District of Pennsylvania denied limitation of liability because:

1. The accident would not have occurred if the astern turbine of the EDGAR M. QUEENY had been able to supply sufficient power to stop the vessel prior to the ramming;

2. A defective valve prevented the turbine from achieving sufficient power; and

3. The defect was within the privity and knowledge of the owner of the vessel.

On July 17, 1980, Judge Weiner awarded $16.2 million to British Petroleum and Sohio for damages caused to the dock facility. The court also awarded $3 million to the Villaneuva Compania Naviera SA of Panama, owners of the CORINTHOS. Oil spill cleanup costs and damages were not part of the litigation.

Bankers Trust, Monsanto, and Keystone appealed the Court's decision to the U.S. Circuit Court of Appeals for the Third Cir-

EDGAR M. QUEENY cont'd.

cuit, but only regarding the valuation of the CORINTHOS. There was no appeal concerning the denial of limitation.

Total cleanup costs for oil pollution came to $2.55 million; there were no third-party pollution claims. The P&I Club involved had completed all payments by September 1976. Under the FWPCA, owner's liability was $100 per GRT, or $1.9 million. CRISTAL then reimbursed the P&I Club for the difference ($650,000), in June 1977. Thus, oil pollution costs were paid by the P&I Club and CRISTAL well before the litigation was completed, which eventually denied the QUEENY's right to limitation.

ELENI V

The 18,287 DWT Greek tanker ELENI V collided on May 6, 1978, with the bulk carrier ROSELINE off the east coast of England (52°49'N, 01°47'E) and spilled 3,000 tons of heavy fuel oil. The collision cut the ELENI V in two--the after two thirds of the ship was salvaged, while the bow section was towed out to sea and detonated almost a month after the collision.

A report was prepared by a select committee in Parliament regarding the ELENI V incident, and the Department of Trade was to respond formally. The Secretary of Trade estimated that the costs incurred by government and local authorities in dealing with the bow section of the vessel amounted to L2.5 million (or nearly $5 million), and the cost of dealing with the associated pollution of the sea and coastline amounted to L1 million.

This case falls under CLC since the United Kingdom is a signatory; FUND does not apply as it had not yet entered into force.

In an unusual occurrence, CRISTAL joined together with the P&I Club and promptly paid fishermen's claims of $31,000 (CRISTAL contributed $20,000 toward the total). CRISTAL's participation in this quick assistance to the fishermen was a departure from its normal policy of last-resort payment, motivated by its desire to be seen to respond rapidly in a hardship case.

Claims presently outstanding amount to $6.48 million plus interest and legal costs. The shipowner's gross limitation under CLC is about $1.8 million. Sources of compensation to be exhausted prior to claiming against CRISTAL include the shipowner and the colliding vessel.

This collision case has resulted in complex litigation, which in 1982 determined degrees of responsibility between the colliding vessels. The United Kingdom government is presently considering whether there should be further legal action to deny the right of limitation by the shipowner(s).

There is some disagreement over the amount of the claims submitted. This has to do with whether or not overheads related to Government cleanup costs should be included. There is also a question as to the reasonableness of certain cleanup

ELENI V cont'd.

costs, since the Government is alleged to have continued to apply dispersants after technical advice indicated these would not be effective.

ESSO BAYWAY

The 50,111 DWT Liberian tanker ESSO BAYWAY spilled approximately 263,000 gallons of light Arabian crude oil after it was holed by its own anchor (in No. 2 center tank) while proceeding up the Neches River near Port Neches, Texas, on January 28, 1979. The vessel drifted over its anchor while attempting to anchor in order to avoid a partially submerged barge.

The cleanup was directed by EXXON (the tanker owners), who flew down a team of cleanup people. An independent cleanup specialist and assessor retained by the P&I Club also assisted on-scene. A thorough cleanup was carried out, including some hard-to-clean areas of reeds. A parking lot was resurfaced due to the hard wear caused by trucks during the operation. Total costs were about $1.74 million.

Although both cleanup costs and third-party claims were involved, there was no litigation in this case. This appears to be mainly because the owners immediately took responsibility and effectively carried out the cleanup. The P&I Club reimbursed EXXON's costs promptly. The cost per GRT ($63) was not high enough to involve CRISTAL.

ESSO INDONESIA

The 114,796 GRT tanker ESSO INDONESIA struck a single-buoy mooring in Singapore in 1978 and fractured the underwater pipeline leading ashore from the buoy. Oil was spilled from the pipeline before it could be shut off. The incident was not too severe, and the cleanup was handled by the Port of Singapore Authority. Total costs of $5.2 million were incurred by the P&I Club for cleanup, for repairing the pipeline and the buoy, and for disruption of operations at the buoy.

This case is not included in the database as there was no spill of oil from the tanker--hence, it would not be covered by the regimes under consideration. It is therefore an interesting example of a pollution incident caused by a tanker, but not covered by the terms of the regimes. This was treated as a negligence case by the P&I Club, and payment was made without any legal complications or litigation.

ETHEL H

This barge stranded and spilled in the Hudson River on February 4, 1977. The cleanup was conducted by the U.S. Coast Guard. The owner of the tug, McAllister Bros., was liable under the FWPCA for a limitation amount of $23,100 ($100 per GRT x 231 GRT of the tug). The Coast Guard claim amounted to $1.034 million, and there were apparently no other claims. Government representatives met with P&I Club personnel in January 1978 to discuss the Coast Guard's claim.

While there was some question as to whether the owner could limit his liability, this was apparently accepted by all parties without resorting to litigation. The P&I Club paid the Coast Guard's costs, and since it was a CRISTAL cargo (CRISTAL at that time covered only cleanup costs, but there were apparently no third-party claims), CRISTAL reimbursed the P&I Club in the amount of $1.014 million in May 1978.

Total time from incident to final settlement was thus about 15 months. The speediness of the settlement is clearly due in part to the fact that the case was not litigated.

This case is also interesting in that it is one of only four cases in the United States that have involved CRISTAL. It was covered by CRISTAL because of the cargo ownership, and because the barge was a seagoing barge.

FUKUTOKU MARU NO. 8

The Japanese tanker FUKUTOKU MARU NO. 8 (499 GRT), carrying 700 tons of Bunker C fuel oil as cargo, collided with the gravel carrier KOSHU MARU in Tachibana Bay, Japan, on April 3, 1982. About 85 tons of cargo oil escaped, polluting intensive fishing areas and coastline.

Cleanup operations were carried out on behalf of the shipowners by the Japan Maritime Disaster Prevention Center, commercial cleanup operators and fishermen, as well as by the Japanese authorities. Cleanup costs were settled at about $630,000. In addition, claims by fishermen were negotiated on behalf of owners and the FUND, in an amount of approximately $970,000. The shipowner's CLC limitation is $87,000, leaving the FUND with liabilities of about $1,530,000, including the rollback to the owner. Cleanup costs and fishery damage claims were paid by the FUND in January 1983. Indemnification will be paid after completion of the limitation proceedings. (Actual yen costs converted at Y240 to the dollar.)

A lawyer retained by the FUND reported that the collision was due to the fact that the FUKUTOKU MARU NO. 8 was navigating at night without exhibiting any navigation lights, and should be therefore 100 percent to blame for the incident.

However, according to the lawyer, this error was not within the actual fault or privity of the owner, since navigation at night without any lights is beyond the control of the shipowner, provided he employs a qualified master and crew and the lights are technically in order. The FUND, therefore, has not attempted to break the owner's limitation. The possibility of taking recourse against the other ship involved in the collision is, however, being investigated.

GLOBE ASSIMI

The 20,000 DWT Gibraltar-registered tanker GLOBE ASSIMI lost control, ran aground, and broke up while steaming out of the port of Klaipeda, USSR, in the Baltic Sea during a gale on November 22, 1981. The vessel's cargo of 16,000 tons of heavy fuel oil was spilled, and a large slick entered the port of Klaipeda and later drifted out to sea. No oil reached the territory of any FUND member state (USSR is not a FUND member), and no claims for pollution damage have been made against the FUND. The cargo was not a CRISTAL cargo.

The USSR is a CLC nation, and the P&I Club established the limitation fund (1.35 million rubles, or about $1.6 million) in the People's Court of Klaipeda. A claim for 743 million rubles (about $900 million) has been filed by the authorities with the court in respect of oil pollution damage. This figure probably includes a claim for the restoration of the polluted water, based on the cubic meters of affected sea.

Since Gibraltar (part of the U.K.) is a FUND contracting state, the FUND will pay a rollback to the shipowner of about $400,000. A Soviet lawyer retained by the FUND has determined that valid 1974 SOLAS and 1966 Load Line certificates were available, and it is not yet clear whether the FUND will be able to deny payment of indemnification.

It is not yet known whether the Soviet authorities will attempt to break the shipowner's liability in court by proving fault or privity.

HOSEI MARU

The Japanese tanker HOSEI MARU (983 GRT) collided with another Japanese tanker (the KINREI MARU of 998 GRT) in dense fog in Honshu, Japan, on August 21, 1980. This collision resulted in a spill of 270 tons of Bunker C fuel oil from the HOSEI MARU. The oil polluted several small bays where intensive fish culture operations are carried out.

The cleanup was handled by the Japan Maritime Disaster Prevention Center, commercial clean-up operators, and fishermen as well as the Japanese authorities. Total cleanup costs amounted to about $800,000. Fishery damage claims of about $240,000 were paid. The shipowner's limitation under CLC was approximately $150,000, based on the vessel's tonnage. FUND liability would, therefore, be about $890,000, plus a rollback to the owner of about $40,000. (Actual yen costs converted at Y240 to the dollar.)

There was some question as to whether the incident might have been caused by the shipowner's personal fault or privity, so the FUND retained a Japanese lawyer to investigate. The issues raised were:

(1) whether the collision might have been caused by the failure of the HOSEI MARU's boatswain to comply with navigation rules because he was not sufficiently qualified; and

(2) whether the vessel's complement of five watchkeeping seamen as opposed to the required six constituted fault.

The FUND's researches revealed that, due to tne boatswain's experience at sea, it was not illegal to assign the boatswain as a responsible watchkeeper. There was, therefore, insufficient evidence to prove that the collision had occurred as a result of the owner's personal fault or privity. Once the limitation proceedings have been finalized, the FUND will pay indemnification to the shipowner.

HYGRADE 95

This incident occurred on the Hudson River at Roseton, New York, on October 31, 1980. Cargo oil (No. 6 heavy fuel oil) was spilled while the barge was discharging at a dock. The owner took responsibility for the spill, and cleanup was directed by the P&I Club's representative (total costs just under $300,000). These costs mainly involved oil removal, and some yacht cleaning. All claims were promptly handled, and no litigation was involved between damaged parties and the owner.

At present, the owner is, however, pursuing litigation against the manufacturer of a flange that was allegedly defective and a cause of the spill. The case is not yet settled.

INDEPENDENTA

This Rumanian-flag tanker was struck by a Greek cargo ship in the Bosporus near Istanbul, Turkey. The INDEPENDENTA exploded, burned, and sank. No cleanup activities were carried out, and there was little pollution damage.

The INDEPENDENTA illustrates the problems encountered when a country has not adhered to CLC/FUND and has no clear national laws on limitation. While the P&I Club gave the Turkish government oil booms (worth about $250,000) in case they might be needed, no other payments have yet been made in the case. The government originally claimed $437 million in damage, based on a vague claim of general environmental losses to the sea. Because of the Turkish position, claims for about $1 million by fishermen (which could be substantiated) have not been paid either. The case has not yet gone to court. One issue is wreck removal; as there is now little or no oil left, wreck removal would appear to be related to removing a navigation hazard rather than preventing oil pollution.

While the P&I Club offered to perform some cleanup operations, the offer was declined by the Turkish authorities. The P&I Club believes that there were provable oil pollution claims (related to fishermen's damages, tug costs, etc.) that might amount to $5 million. However, the Club is unwilling to offer TOVALOP or any other standard because it is not clear that the government would be satisfied in relation to the very high initial claim. As a result, no partial payment has been made and the matter continues unresolved.

JOSE MARTI

The 27,700 GRT Soviet tanker JOSE MARTI grounded near Dalaro, Sweden, and spilled over 1,000 tons of No. 4 fuel oil on January 7, 1981. An issue has been raised as to whether or not an allegedly uncharted rock caused the incident.

The Swedish Coast Guard immediately initiated at-sea cleanup operations, while the shore cleanup was commenced in the spring when weather conditions improved. Total cleanup costs amounted to 19.3 million Swedish Crowns, or approximately $3.8 million.

In October 1981, the Swedish government issued a claim in the Stockholm City Court against the Soviet shipowner, in order to allow the owner to establish the CLC limitation fund. The owner's liability under the CLC is about $3.4 million, depending upon the exchange rate in effect at the time of the establishment of the limitation fund. This fund has not yet been established, apparently because of delays on the part of the P&I Club. If claims exceed the CLC limitation amount, the IOPC Fund may become involved.

The shipowner maintains that he is not liable for the incident under CLC, since the rock on which the ship ran aground was not shown on the charts recommended for navigational use.

The relevant defense is as follows:

> "No liability for pollution damage shall attach to the owner if he proves that the damage:
>
> . . . (c) was wholly caused by the negligence or other wrongful act of any Government or other authority responsible for the maintenance of lights or other navigational aids in the exercise of that function."
>
> (International Convention on Civil Liability for Oil Pollution Damage, 1969, Article III.2(c))

The Swedish Government, however, is of the opinion that the incident was wholly or primarily caused through the pilot's fault. There is no suggestion that the shipowner's limitation might be broken, and all applicable certificates were available and in order.

This case has not yet been settled. However, there are similarities between this case and the 1977 case of the TSESIS,

JOSE MARTI cont'd.

which also spilled in Swedish waters and involved the same owner and the same P&I Club. In that case, the Supreme Court of Sweden found that the incident was wholly caused by the negligence of the Swedish Government in maintaining maritime charts.

If the owner of the JOSE MARTI is relieved of liability in the Swedish Court under Article III.2(c) of the CLC, the FUND would not accept liability. In such a case, the FUND's view would be that the IOPC Fund would be wholly exonerated from its obligation to pay compensation, except for preventive measures, under Article 4.3 of the FUND Convention:

> "If the Fund proves that the pollution damage resulted wholly or partially from an act or omission . . . by the person who suffered the damage <u>or from the negligence of that person</u>, the Fund may be exonerated wholly or partially from its obligation to pay compensation to such person provided, however, that there shall be no such exoneration with regard to such preventive measures which are compensated under paragraph 1 . . . (<u>IOPC Fund Convention</u>, 1971, Article 4.3, emphasis supplied.)

JUAN ANTONIO LAVALLEJA

The 130,000 DWT Uruguayan tanker JUAN ANTONIO LAVALLEJA struck a breakwater and grounded in the port of Arzew, Algeria, during a storm on December 28, 1980. The vessel spilled 40,000 tons of her cargo of LNG condensate into the port and the sea.

This case raised the issue of persistent versus non-persistent oil, since the FUND only covers persistent oil. The FUND's "Guide to the Nature and Definition of Persistent Oil" was used to determine that the cargo oil involved could not be considered persistent. The Director informed the Algerian authorities that the FUND would not accept liability for the pollution damage that might have been caused by the JUAN ANTONIO LAVALLEJA incident. In fact, there was minimal cleanup involved, as the spill evaporated.

KURDISTAN

The British flag tanker KURDISTAN spilled a quantity of heavy fuel oil (about 7,000 tons) in the Cabot Strait off Nova Scotia, Canada, on March 15, 1979. Although the vessel was entered in TOVALOP, there was no involvement of TOVALOP since the Canadian Government has its own legislation.

Under Canadian law, the shipowner's limit of liability has been established at approximately C$3.6 million and that sum has been paid into court in Canada.

The Canadian Government is resisting the shipowner's application to limit his liability on the grounds that the total claim is very much in excess of that limit. It appears that the amount of expenditure may be as high as C$8 million (about US$6.6 million), and the full extent of the expenditure is being assessed by a firm of accountants at the present time.

If the shipowner succeeds in obtaining a limitation decree before the Canadian court, any balance not recoverable by the Canadian Government from the shipowner will be a claim on the Canada Oil Pollution Fund. If the owner fails to establish his right to limit, then the balance will have to be paid by the P&I Club which covered the shipowner.

CRISTAL has paid an indemnity of US$931,000 to the shipowner's P&I Club, after concluding that the incident did not result from the willful misconduct of the owner or from the unseaworthiness of the tanker with the privity of the owner. Further liability of CRISTAL remains to be resolved. The Canadian authorities sank the bow section of the KURDISTAN and have claimed that this was done as a pollution prevention measure, but CRISTAL has not accepted this claim.

The shipowner is maintaining an action in Canada against the Canadian Government for sinking the bow section which, it is alleged, was unnecessary and was carried out for political reasons rather than for oil pollution protection.

NEPCO 140

The 10,000 ton barge NEPCO 140 struck bottom while being pushed by the tug EILEEN C in the St. Lawrence River on June 23, 1976. Both tug and barge were U.S. vessels. The grounding was apparently due to a navigation error by the tug. The grounding caused a spill of about 6,400 barrels of the oil cargo (No. 6 heavy fuel oil), and the tug then moved the barge to an anchorage area, where the barge grounded a second time, ripping the hull in a different place and causing a second spill.

The case raises interesting issues. Cleanup was performed by the U.S. Coast Guard, after the remaining oil in the damaged tanks was pumped out and the barge towed to its original destination. Because of the low FWPCA limits, the owner had no incentive to complete the cleanup operation. There is still uncertainty as to whether the incident should be counted as one or two spills, thus affecting the limit of liability under the FWPCA. Also, the incident created some damage in Canada, raising a multicountry issue. A separate fund was established to deal with third-party claims. Coast Guard cleanup costs (about $9 million) greatly exceeded the FWPCA limit of $100 per GRT for the barge, which amounts to about $1.7 million (two incidents x $100 x 8,500 GRT of barge).

This case went to court, and is still not settled, nearly seven years later. The U.S. government tried to use common law to break the shipowner's liability, but was unsuccessful both in the District Court of New York (1978) and on appeal (1980 decision). The courts found that the remedies specified by the FWPCA ($100 per GRT) held in this case. Apparently, the U.S. government is preparing to go to court now in an attempt to break the shipowner's right to limitation under the FWPCA (willful negligence criterion).

Costs have been incurred both by the Coast Guard and by the P&I Club involved. The U.S. government has reimbursed Canada for its cleanup costs, combining those costs with its own in the Coast Guard claim. Property owners' third-party claims have been presented to the P&I Club, and just over $2 million of such claims have been paid to date by the Club. The P&I Club has also incurred over $1 million in legal and claims settlement fees in the case so far.

Because the U.S. government has chosen to litigate the case, no payment at all has so far been made by the P&I Club to the government for its cleanup costs. At issue presently are the following questions:

NEPCO 140 cont'd.

- Can the government succeed in breaking the owner's liability limit under FWPCA?
- Were there one or two incidents?
- Does the government bear any share in the blame due to the alleged misplacement of a buoy in the anchorage where the second spill occurred?

While these issues await litigation, the government has not yet recovered its funds.

ONDINA

This 31,000 GRT Dutch tanker spilled between 200 and 400 tons of a viscous Venezuelan crude oil, while discharging at Hamburg, Germany on March 3, 1982. The accidental discharge of oil was apparently caused by a valve defect or mishandling of the valve. The oil polluted over 8 km of stone embankments in the harbor, and the authorities required that the stones be cleaned.

West Germany is a member of CLC and FUND, so the P&I Club applied for and was requested to establish a limitation fund in the amount of DM 10.325 million in July 1982. The P&I Club had meanwhile paid the cleanup bill, amounting to about $9.68 million.

The P&I Club consulted the FUND Director during the cleanup to seek assurance that the FUND would reimburse the Club for costs above the CLC limit. To this extent, the FUND was involved in reviewing the cleanup effort undertaken.

A difference of opinion arose over the possible use of dispersants to remove the oil lying between and underneath the rocks. The experts jointly employed by the P&I Club and the FUND believed that chemical dispersants were indicated, but the State of Hamburg authorities did not permit a field trial of the proposed cleanup method and refused to allow the use of dispersants. As a result, the cleanup took several weeks longer and was allegedly less effective than it might have been. Some further measures proposed by the local authorities to help improve water quality (after the cleanup work had been accepted as complete) were not accepted by the P&I Club or the FUND, as their experts indicated that the proposed measures were not appropriate.

As of autumn 1982, the FUND had not received the detailed claim and thus was not yet able to determine its reasonableness. The FUND Director was also trying to obtain further information to decide whether there was sufficient evidence to try to break the owner's limitation.

The ONDINA case is a good example of FUND involvement in a spill, and of the FUND's responsibility both to determine that the cleanup measures taken are reasonable and to see whether the owner's limitation can be broken. Involvement by the FUND during the cleanup operation is aimed at agreement, whenever possible, as to the reasonableness of proposed measures rather than waiting until the invoices are submitted to make the determination.

CRISTAL will pay an indemnity to the shipowner in this case, as the Netherlands (registry of the vessel) was not a member of FUND at the time of the spill.

PRINCESS ANNE MARIE

The 70,271 DWT Greek tanker PRINCESS ANNE MARIE spilled up to 6,000 tons of fuel and crude oil following its grounding at southwestern Cuba on January 28, 1980, as a result of a navigational error. The cargo was owned by Texaco, and the vessel was underway from the Cayman Islands to Texas. Cuba is not a member of CLC, and the Cuban government, after refloating the vessel, attached the ship and required a $16 million bond. The vessel was released on March 10, 1980, after the owner's P&I Club posted the bond.

Some debate exists concerning the degree of damage caused by the PRINCESS ANNE MARIE. The Cuban government claimed $70 million damage to its lobster fisheries based on extensive lobster-catch and fishing-effort data. On a scientific basis, it is difficult to validate the Cuban claim that the amount of oil that reached the lobster area could have caused such extensive fisheries damage. However, the P&I Club settled for $30 million to avoid a potential claim of $70 million in Cuban courts. CRISTAL was consulted prior to the settlement and advised the P&I Club to use its best judgment. Following the settlement, CRISTAL's board approved reimbursement to the P&I Club of $26.0 million. CRISTAL's decision was based in part on the view that the conditions for breaking the owner's limit did not exist.

This case raised several important issues:

1. This was an estimate of direct economic damages, even if a rough calculation; conceptually different from the noneconomic "natural resource" damages alleged in ZOE COLOCOTRONI and ANTONIO GRAMSCI. This case shows the power of national government or courts to decide what is a reasonable estimate of economic damages.

2. CRISTAL role--CRISTAL acted as last recourse. It was consulted but not intimately involved, and subsequently weighed the pros and cons carefully before deciding to reimburse the P&I Club. The primary exposure was with the P&I Club. FUND's operating procedures would likely have involved it more directly in the settlement of the case than the relatively low-profile role adopted by CRISTAL. Note that the claim was under Cuban law, not under TOVALOP or CLC.

PRINCESS ANNE MARIE cont'd.

3. Political issues--the Cuban government adopted a strong stance with regard to recovery of damages. This placed the vessel owner, the P&I Club, and CRISTAL in a delicate international political situation.

RICHARD C. SAUER

This Liberian flag tanker ran aground at Perth Amboy on October 29, 1976, and spilled over 6,000 barrels of crude oil. The vessel was owned by Marine Transport Lines, under charter to Chevron. The shipowner initially allowed Chevron to do the cleanup, but became concerned at the high expenditures in relation to results achieved ($1.2 million spent in the first six days). The P&I Club representative arrived on scene on November 5, and formally took over the cleanup operation on November 12, on behalf of the owners.

In addition to the expenses incurred by Chevron, there was oil damage to the Perth Amboy Drydock facilities, and some yacht- and bird-cleaning.

Total costs of about $1.8 million were well under the FWPCA limitation figure. There was no litigation associated with this incident.

SANSINENA

This Liberian-flag tanker under charter to Union Oil exploded and sank at its berth in San Pedro, California, on December 17, 1976, after completing the discharge of a cargo of Indonesian crude oil. The SANSINENA measured 38,562 GRT, so at $100 per GRT the limit would have been $3.9 million. In fact, pollution cleanup costs somewhat exceeded the limit.

There was no cargo aboard at the time of the incident, but bunkers bubbled up from the wreck for some time. The P&I Club paid out $4,719,000 for oil pollution cleanup only (there were no third-party pollution claims). In addition, the Club paid $19 million in injury claims due to the explosion of the tanker.

This cleanup was handled smoothly, with the owner (Barracuda Tankers) taking responsibility, and Union Oil (the time charterers and owners of the terminal) officials in attendance as well as the Coast Guard. The SANSINENA case was not litigated.

TANIO

The Madagascar-registered tanker TANIO (16,000 GRT) fractured in heavy seas on March 7, 1980, and spilled about 12,500 tons of heavy fuel oil off the coast of Brittany, France. The vessel was carrying 26,000 tons of fuel oil from West Germany to Italy. The fore section of the TANIO containing 6,000 tons of heavy fuel sank to a depth of 90 meters. The stern section, containing 6,000 tons of heavy fuel oil and 600 tons of bunker oil, remained afloat and was towed from the area.

The French government took cleanup responsibility, and the beach pollution cleanup was completed by the beginning of the 1980 summer season. The government then hired a contractor to pump the remaining oil out of the sunken fore section. The pumping operation eventually cost some $35 million after numerous complications and delays due to bad weather and equipment alterations, and was completed in August 1981.

Total claims to date are about $70 million at current exchange rates, including the pumping operation. This amount greatly exceeds the shipowner's limitation of about $2.1 million and the FUND limit as well.

The spill raises several important issues:

- Are victims of spills adequately covered by current FUND limits?

  --In this case, claims considerably exceed FUND limits and even if FUND agrees to the costs of the pumping operation, the French government will not be fully compensated for its cleanup efforts.

- What role does FUND play in a major spill situation?

  --The French government consulted with FUND regarding the decision to hire a contractor and attempt to recover the remaining oil from the sunken section by pumping. The FUND Director provided the French with a letter agreeing in principle with this step, as long as it was accomplished within reasonable time and budget constraints. This was designed to clarify early-on that FUND would agree to cover specific actions deemed necessary to prevent pollution.

TANIO cont'd.

- How does FUND evaluate, after the fact, the reasonableness of measures taken?

  --In this case, FUND raised questions as to whether the full $35 million incurred in the pumping operation are justifiable. The final cost of the operation was about three times the original estimate, and the work was continued over a winter season when the probability of success was very low. FUND employed an independent surveyor who advised that the pumping operations were not properly based on a sound analysis of the weather. The FUND has therefore suggested to the French an alternative calculation of this cost, resulting in a figure of $23 million.

- Under what conditions does FUND attempt to break the shipowner's right to limit liability?

  --In cases where there is some question on the owner's right to limitation, FUND generally retains specialists to investigate the possibility of showing that the incident occurred "as a result of the actual fault or privity of the owner." Technical reports prepared for the French courts and the IOPC Fund have established poor-quality welding, carried out in late-1979 by an Italian ship repair yard, as one of the causes of the vessel's fracture. Defective cargo distribution has also been identified as one of the contributory causes of the casualty. FUND (and the French Government) have therefore taken legal action against the vessel owners, on the basis that the vessel's unseaworthiness as a result of bad welding is the personal fault of the owners. The concept of "personal fault" is French law is considerably wider than "actual fault or privity" in English law.

- What recourse does FUND have against third parties?

  --FUND has also brought legal action against several third parties, including the ship repair yard, the ship's technical managers, the ship classification society involved, the vessel's

TANIO cont'd.

former owners, the bareboat charterers, and the P&I Club. Negligence theories revolving around allegedly defective welding and loading of the vessel are the basis for these actions. The French Court has not yet reached a decision.

- Can the FUND pay compensation prior to the completion of all legal actions?

  --In this case, as in all previous cases, the IOPC Fund's practice will be to pay out compensation while the question of breaking the owner's liability is still being investigated. The Executive Committee of the FUND assessed the French claim at about $45 million in April 1983, and contributions will be levied in 1983 to permit payment of this amount. The French Government has accepted this sum only as the basis for distribution of the compensation available under the FUND Convention, and maintains its right to claim the full amount of damages against other parties.

TARPENBEK

The 1,800 DWT West German tanker TARPENBEK collided with the British naval vessel SIR GERAINT off the English coast on June 21, 1979. The TARPENBEK was carrying 1,600 tons of lubricating oil. The vessel capsized, but no cargo was spilled; a small amount of light diesel oil from the bunker tanks was lost. The TARPENBEK was towed to a sheltered bay, the cargo removed, and then righted, before being towed to a safe port.

This case raises the issue of pre-spill preventive measures. The CLC and FUND Conventions are not entirely clear on this point, although the wording seems to indicate that only measures taken after a spill are covered:

> "Pollution damage". . . includes the costs of preventive measures and further loss or damage caused by preventive measures.
>
> "Preventive measures" means any reasonable measures taken by any person after an incident has occurred to prevent or minimize pollution damage.
>
> "Incident" means any occurrence, or series of occurrences having the same origin, which causes pollution damage.
>
> (International Convention on Civil Liability for Oil Pollution Damage, 1969, Article I.)

The FUND claims that liability will be accepted only for expenses incurred for preventive measures taken after the actual discharge or escape of persistent oil from a ship, and has therefore rejected claims resulting from the TARPENBEK incident. The shipowner and the U.K. government believe that the FUND does cover pre-spill expenses where there is an imminent threat of spill.

This case exposes a difference between CLC and TOVALOP, as the latter agreement (and CRISTAL) very specifically includes threat removal measures, whether or not pollution subsequently occurs. At present, writs have been served at the Admiralty Court against the FUND by the U.K. Department of Trade and Ministry of Defence, by the Nature Conservancy Council, by the Isle of Wight County Council, and by the shipowner and his P&I Club. Total claims amount to about $720,000 for owner's

TARPENBEK cont'd.

preventive measures, and $1.8 million for preventive measures taken by the government. There is disagreement over whether or not any cargo oil was spilled during the pumping operation. In the event that the FUND does not cover the claim, CRISTAL will be liable.

The TARPENBEK case remains sub judice. Even if the British naval vessel is found to be at fault in the collision, there is little possibility of the TARPENBEK's owner being able to recover pollution prevention expenses from the colliding vessel.

ZOE COLOCOTRONI

On March 18, 1983, the 15,899 GRT tanker ZOE COLOCOTRONI deliberately discharged some 5,170 tons of crude oil into the sea in order to free herself from a grounding on the coast of Puerto Rico. The oil damaged an area of 23 acres of mangrove swamp. The Coast Guard incurred cleanup costs of about $680,000 and there were limited other costs involved. There was, however, considerable litigation over the owner's right to limit liability under the Limitation of Liability Act, and particularly over the proper standard to be used in assessing natural resource damage.

The United States District Court of Puerto Rico found, in August 1978, as follows:

1. The owners were not entitled to limit liability, because the vessel's unseaworthiness and the negligence of the owners were the proximate causes of the pollution damage. Specific factors were the lack of proper charts onboard, inoperative or defective navigation equipment, and an incompetent crew.

2. Damages were assessed on the basis of an estimate of the reduction in marine organisms and the damage to the mangrove swamp. The formula applied to the first element was an estimate of the number of organisms per acre of affected water, and the cost per organism based on biological supply laboratory catalogues. The damages to the mangrove swamp were estimated based on the cost to plant and maintain a mangrove. In all, the court awarded damages of $6.2 million to the Commonwealth of Puerto Rico, plus costs and interest.

Following the District Court decision, an appeal was brought before the First Circuit Court of Appeals regarding the basis for calculating the damage to the affected water area ($5.5 million based on the value of the marine organisms). The Appeals Court found, in August 1980, that the District Court decision in favor of Puerto Rico's damage definition was wrong; but it also did not accept the owner's contention that provable economic damages (decrease in property value) were the correct standard. Rather, the court found that the appropriate standard is

> ". . . The cost reasonably to be incurred by the sovereign to restore or rehabilitate the environment in the affected area to its preexisting condition or as close thereto as is feasible without grossly disproportionate costs."

ZOE COLOCOTRONI cont'd.

This finding accepts the principle that many areas have ecological but not commercial value. But it also introduces a "reasonable cost" aspect that prevents the type of damage claim based on abstract values per organism. A settlement is still pending in this case.

This case is significant in that it represents the most detailed analysis of natural resource damages under U.S. law. The finding of the Appeals Court permits a broader definition of damages than does FUND in the resolution adopted following the U.S.S.R.'s claim in the ANTONIO GRAMSCI case. The FUND definition, at present, refers to quantifiable economic losses, while the Appeals Court recognizes environmental damages going beyond pure economic losses.

Appendix E

FUTURE INTERNATIONAL OIL MARKETS AND THEIR RELATIONSHIP TO TANKER TRAFFIC

Appendix E

FUTURE INTERNATIONAL OIL MARKETS AND THEIR RELATIONSHIP TO TANKER TRAFFIC

Three basic features will characterize international crude oil markets in the next decade and will have a significant impact on the volume of seaborne crude shipments: flat or slowly rising demand for oil products, considerable uncertainty about price and supply, and regionalization of crude oil production.

A. DEMAND

The worldwide decline in oil consumption that commenced in 1980 is now widely perceived to be more than a transitory phenomenon primarily caused by low rates of economic growth in the industrialized world. It now appears that the historical relationships between energy and oil use and economic activity may have been broken. In OECD nations the oil volume per unit of GNP ratio declined 1.8 percent from 1973 to 1978, 6.5 percent from 1978 to 1980, and 8 percent in 1980-1981, indicating a declining need for petroleum to support economic activity. A report released in mid-1982 by the OECD's International Energy Agency (IEA) indicated that the trend toward less oil-intensive economies is actually accelerating rather than slowing down in its 21 member countries. The IEA data suggest that the acceleration away from oil began before the Iranian Revolution-induced price shock of 1979, and that the oil-use cutbacks of 1980-1982 were more a delayed reaction to the 1973-1974 price shock than an immediate response to the 1979-1980 price increases. Because of the long delay time between price changes and consumption changes, this suggests that price-induced oil savings will accelerate in the remainder of this decade. The effects of the rapid price increases in 1979 and 1980 may not yet have been fully felt.

In the European Economic Community, the collective GNP rose 1.4 percent in 1980 while energy consumption declined 4.2 percent. In the OECD-member nations, GDP increased 1.3 percent while oil consumption declined 5.7 percent in 1981. In the industrialized and developing economies of the Far East, which have experienced much stronger economic growth in the last two years than Europe and the United States, oil consumption is falling even more rapidly than in the West. It had been common oil industry wisdom that the growing oil needs of the developing

countries would inevitably offset future demand declines in the industrialized nations. A British Petroleum study in early 1982 indicated that the increase in oil demand by the Far East nations had slowed from a rate of 8-9 percent in 1973 to 2.1 percent in 1981 (a decline occurred in every year except 1976).

Expert opinion still differs as to how much of the 1979-1982 consumption decline should be attributed to so-called structural changes (e.g., fuel substitution, permanent conservation measures) and how much to economic stagnation. An American Petroleum Institute study in 1982 supports a common U.S. oil industry view that about one-third of the decline may be attributed to a stagnation in economic growth. OPEC economists, on the other hand, estimate that about two-thirds of the decline may be due to the recession.

B. PETROLEUM FORECASTING

Oil consumption in 1982 in the world outside the Centrally Planned Economies was forecast in the early 1970s by oil companies, economists, government agencies, and intelligence agencies to be about 75 million barrels per day. Actual 1982 consumption was just over 44 million barrels per day. These forecasters have been discouraged by the fact that the best efforts of oil industry observers using the best analytical tools were so erroneous. Recent oil industry forecasts provide only very modest consumption forecasts. Shell Oil Company's 1982 projections put world consumption (excluding COMECON nations and China) at 45 million barrels per day in 1985 and 46 to 47 million barrels per day in 1990. Chase Manhattan, which assumes higher economic growth rates for these countries, predicts a figure of 50 million barrels per day for 1990. The same forecast assumes a decline in U.S. consumption to 14 million barrels per day by 1990. 1982 U.S. demand is estimated at 15.2 million barrels per day.

All of these predictions are sensitive to price fluctuations. The DOE U.S. model indicates that a real decline in oil prices over a five-year period would boost demand by two million barrels per day by 1990 and cut domestic production by one million barrels per day by 1990. The result would be a three million barrels per day increase in oil imports. While these figures may be excessive, a period of sustained real price decline could considerably boost demand. This is likely despite the permanent decline in gasoline consumption brought on by more fuel-efficient automobiles and the decline in residual oil sales produced by worldwide utilities switching to coal.

The role of vastly improved economic activity in boosting demand is difficult to forecast. Whereas OPEC economists have tended to believe that rapid economic recovery in the industrialized world would quickly boost oil consumption, this scenario is not assured. Lower interest rates and higher plant utilization rates may simply accelerate fuel conservation and substitution investments and the replacement of older, less fuel efficient automobiles, trucks, and airplanes by newer, more fuel-efficient vehicles.

C. PETROLEUM INDUSTRY UNCERTAINTIES

All energy forecasting and planning in the remainder of this decade will take place in an environment of extreme uncertainty about demand, supply, and price. Until the 1970s international oil companies adjusted supply to meet demand by transferring market variations to the oil producing countries. After 1973 OPEC assumed the role of price administrator but supply and demand were no longer integrated in the same planning entity. In periods of high demand or supply disruption OPEC official prices tended to follow the upward pull in market prices and establish ever higher reference prices. In periods of slack demand, when an unchecked market would normally have led to a price collapse, OPEC was able, at least in nominal terms, to defend its reference price. Thus, during the 1970s the market was permitted to set prices in periods of high demand, but the oil price remained fixed in periods of excess supply.

The current situation in world petroleum markets, soft prices and excess supplies, is the toughest test to date of OPEC's influence on crude prices. At issue is whether OPEC will continue to play a major role in controlling prices or whether market forces will play the dominant role. OPEC members have been willing to accept some production cuts although the brunt of the decrease has been borne by Saudi Arabia. In addition, Arabian crude oils tend to yield a higher fraction of residual oil byproducts. In the recent environment, when conversion of industries and utilities has occurred, refiners have sought to reduce Arabian crude oil liftings and to increase liftings of higher quality crudes. This has exaggerated the Kuwaiti and Saudi dilemma.

A great deal is at stake in the current effort to hold the line on prices in a soft market. If OPEC continues to unofficially lower prices (primarily Nigeria, Iran, and Libya)

and essentially yields its pricing powers to market forces, few will benefit. Producer nations, both inside and outside OPEC, will suffer; so will the oil companies and the governments of most of the major industrialized nations. High oil prices have, by means of higher taxes, considerably enhanced the revenue flow of the treasuries of the governments of Europe and the United States. It is not in government's interest that this situation be altered permanently.

If market forces prevail during the current oversupply situation, petroleum pricing would come to resemble the price movements of other primary commodities: that is the amplitude of price movements would vastly exceed the amplitude of supply and demand changes. It is not in the interest of either OPEC or of consuming nations, or of the oil companies for that matter, that crude oil prices and supplies should begin to behave like those of copper, peanuts, cocoa, and tea.

Moreover, it is important to remember that much of what has been done to find new reserves and increase production in non-OPEC areas is dependent upon high oil prices. The marginal cost of production of crude oil from the Beaufort Sea, the east coast of Canada, the North Sea (the Troll field may contain as much oil as Prudhoe Bay), and from territory recovery projects in the United States is sufficiently high that most of these sources would not be developed if oil prices fell to the $20 (1981 dollars) per barrel range for a sustained period of time.

While market forces appear to be working to prevent sustained oil price rises during the remainder of this decade, political events could alter this scenario, at least temporarily. Oil supplies and stocks are now of sufficient size that the magnitude of the disruption required to cause sustainable major price increases is on the order of the total removal of Saudi Arabian production or a permanent closing of the Straits of Hormuz. Only political events of great magnitude could alter the present supply and demand balance for a period of several years, until the affected nations resumed petroleum production or until other nations increased production to meet demand and capitalize on higher prices. An indication of the decreasing volatility of crude oil prices is that spot prices have not reacted significantly to a number of major events which have occurred in the Middle East during the past 18 months.

The situation does however remain frought with uncertainty. The international oil companies and major oil exporting nations embarked on vast development plans based on the assumption that real oil prices would rise indefinitely. The failure of these expectations to materialize has led to enormous strains on the

combined current account balance fell from a surplus of $110 billion in 1980 to a deficit of $9.5 billion in 1982. The present economic difficulties of some major oil producers such as Mexico (not in OPEC), Venezuela, and Nigeria have the potential to affect future domestic oil production. Virtually all of the currently surplus shut-in productive capacity of 15 to 20 million barrels per day or more is located in areas of political and economic uncertainty as Exhibit E-1 shows. Iraq, Kuwait, Libya, Saudi Arabia, and Iran account for nearly 75 percent of the estimated 17.1 million barrels per day of excess capacity. A period of rising demand sparked by lower oil prices combined with one or more revolutions or wars in crucial exporting countries could still lead to a repeat of the situation of 1973-1974 and 1979-1980.

In addition, a strong U.S. dollar has made oil purchases more costly for many major consuming nations. This fact tends to dampen demand, even as oil prices stabilize or decline. U.S. interest rates, economic growth, and money supply are critical to future movements in this regard.

REGIONALIZATION

The increasing regionalization of not only oil production, but all energy production, will continue to have a major impact on seaborne crude oil transportation for the next decade. In 1981 while OPEC crude oil production dropped sharply, non-OPEC production rose 4 percent. New discoveries in the past two years suggest that this trend will continue and that oil exports from non-OPEC members will continue to increase. Mexico's debt problems have caused it to raise its exports and in 1982 for the first time Mexico replaced Saudi Arabia as the United States' largest foreign crude oil supplier. Brazil, rapidly becoming the industrial giant of South America, is also increasingly meeting its needs with domestically produced crude oil. Oil production to meet domestic needs is on the increase in Guatemala, Colombia, and Argentina.

In Europe, oil production from the British and Norwegian sections of the North Sea will continue to rise for at least another three years. Promising oil finds have also been made in the coastal waters of Spain, Holland, and West Germany. The U.S.S.R. continues to aggressively explore and develop petroleum as a means to earn hard foreign currency.

In North Africa oil exports are increasing from two non-OPEC producers. By 1985 Egypt expects to be producing at the rate of one million barrels per day, and recent finds in Egypt's Western

Desert promise even higher rates of production. The Sudan will become an oil exporter in 1983 after previously being dependent on imports. The entire East African trench, which contains the Nile, is virtually unexplored and early geological indications are very promising for major hydrocarbon deposits in this area. In West Africa oil reserves and production are on the increase in Angola, the Ivory Coast, Ghana, the Cameroons, Zaire, and the Congo.

On the Indian subcontinent new natural gas discoveries in Pakistan and Bangladesh are replacing oil imports. India's production from the Bombay High Field has continued to increase and oil imports are being cut by a combination of an increased reliance on coal and rising domestic oil production.

In Southeast Asia, Thailand, previously an oil importer, will soon be self-sufficient and may become a natural gas exporter. Australia and New Zealand both are increasingly relying on coal and recently discovered reserves of oil and natural gas.

In the Far East, Japan, South Korea, and Taiwan are displacing oil with coal, LNG, and nuclear power. If the exploration and development activity that recently began in the offshore waters of the People's Republic of China (PRC) is as promising as many anticipate, Japan may also increasingly import oil from the PRC. It is doubtful, however, that this will occur before 1990.

In North America-U.S. domestic crude and LNG production has stabilized at around 10 million barrels per day. If oil prices do not collapse, odds favor the continuation of this level of production to 1990 as the consequence of the development of heavy oil fields in California, and fields in the Beaufort Sea off Alaska and in the Santa Maria Basin off California. Canada also has the reserve potential to displace oil imports with domestic production by 1990, although lower oil prices and a controversial national energy policy may prevent the attainment of this goal.

The regionalization of world energy markets has been encouraged by the high cost of oil imports. Both industrialized and developing nations have sought to displace costly foreign energy supplies with domestic sources of energy. This trend has been encouraged by the lending policies of the World Bank and other international development agencies.

There are, however, some countervailing trends that have begun to emerge in international oil markets in the past year. As a consequence of the soft market, Saudi Arabia and Kuwait have ended their destination restrictions on oil exports and are thus

permitting the international oil companies greater latitude in fitting crude purchases into their refining systems. In addition, the lower price expectations produced by current market conditions will cause oil exporters to reassess their drive to develop export refineries in producing regions. A trend may develop to make greater use of already existing facilities, possibly through purchases of these facilities by OPEC's national oil companies. Thus, for example, Venezuela has purchased refining capacity in the United States and Kuwait has invested in West Germany and the U.S. Any trend toward greater utilization of the existing refining infrastructure in the industrialized nations will increase the overall amount of crude oil moved by sea.

Implications for Tanker Owners and Cargo Interests

The transportation of crude oil products has experienced major declines in tonnage, ton-miles, and revenue generating potential since the mid-1970s, as Chapters V and VI discussed. The supply of tankers outpaced demand and rates declined, creating a long-term depression in the tanker industry. Despite major lay-ups and scrapping, the industry remains severely depressed. It is not yet evident that the reductions in capacity can outpace reductions in transportation demand to yield a net improvement in rates and financial returns. Furthermore, any sustained improvement could trigger new construction that would negate any improvement in rates.

The regionalization of petroleum markets will tend to reduce voyage distances and therefore the ton-miles of transportation. Given this trend, the tanker fleet must continue to contract if rates and returns are to improve. It will be years until rates improve appreciably. Until then, shipowners will continue to operate at revenue levels below full cost.

The relationship between oil companies and tanker owners will likely change from its current status of low rates and few long-term charters to one of moderate rates and more long-term charters. The timing of this change cannot be predicted but it is likely.

The oil companies and the shipowners will not have any significant mutuality of interest in the next several years. This is because declining or flat oil prices will increase the importance of reducing costs such as transportation. While in the past the oil companies owned considerable portions of their tanker fleets and hence profited to some extent from high rates, today they are selling or scrapping vessels and will continue to.

There is little chance that oil companies will increase their fleets at present depressed tanker rate levels. If rates do rise above a full-cost level, the oil companies will tend to increase charters to lock-in the costs of a portion of their transportation needs.

U.S. petroleum logistics have been affected not only by levels of U.S. crude oil production and products demand, but also by the changing sources of crude oil. Most notable was the start-up in 1977 of the Trans-Alaskan Pipeline and the increased domestic tanker activity that resulted. At various times, proposals have been made to export some Alaskan crude oil. This would have the effect of reducing U.S.-flag crude oil movements to and from the Panama Canal. Alaskan crude oil would be exported and crude oil would be imported to regions including the Gulf and Atlantic Coasts. U.S.-flag activity would decline, foreign-flag service to the U.S. would increase, and the net tons of crude oil received by U.S. refiners would remain constant.

The implications of an export trade would be nil with respect to contributing oil. Changes in the tanker spill and compensation experience cannot be evaluated, but it is likely that traffic between Valdez, Alaska and Panama would be reduced, the traffic miles along the U.S. Pacific coast would be reduced, and the number of foreign-flag tankers calling at U.S. ports would increase.

EXHIBIT E-1

WORLD OIL PRODUCTION

(thousands of barrels per day)

Country	Historical Maximum	Year Produced	Estimated Production Average 1981	Estimated Production Average 1982	Minimum Additional Production Capacity Average 1982	Official March 1983 OPEC Quotas
Algeria	1,161	1978	805	800	361	725
Iraq	3,477	1979	1,000	800	2,677	1,200
Kuwait	2,500	1979	1,125	860	1,640	1,050
Libya	2,175	1973	1,140	1,700	475	1,100
Qatar	570	1973	405	380	190	300
Saudi Arabia	9,900	1980	9,815	5,960	3,940	5,000
United Arab Emirates	1,999	1977	1,500	1,155	844	1,100
Arab OPEC total	21,094	1979	15,790	11,655	10,127	10,475
Combined Maximum	21,782	(various years)				
Indonesia	1,686	1977	1,605	1,370	316	1,300
Iran	6,022	1974	1,380	2,700	2,322	2,400
Nigeria	2,302	1979	1,445	1,480	822	1,300
Venezuela	3,366	1973	2,110	2,160	1,206	1,675
Total OPEC	31,278	1977	22,680	19,715	14,793	17,500
Combined Maximum	35,158	(various years)				
Canada	1,800	1973	1,280	1,300	-	
Mexico	2,545*	1981	2,310	2,900	-	
United Kingdom	1,885*	1981	1,810	2,285	-	
United States	9,208	1973	8,572	8,676	50	
China	2,133*	1981	2,025	2,025	-	
U.S.S.R.	11,900*	1981	11,800	12,000	-	
Other	5,424*	1981	5,228	5,459	-	
Non-OPEC Total	34,895		33,025	34,560	-	
World	62,698	1979	55,710	54,300		
Combined Maximum	70,053				14,843	

*Monthly peak.

Source: TBS analysis of DOE/EIA Monthly Energy Review; TBS estimates.

END

FILMED

10-83